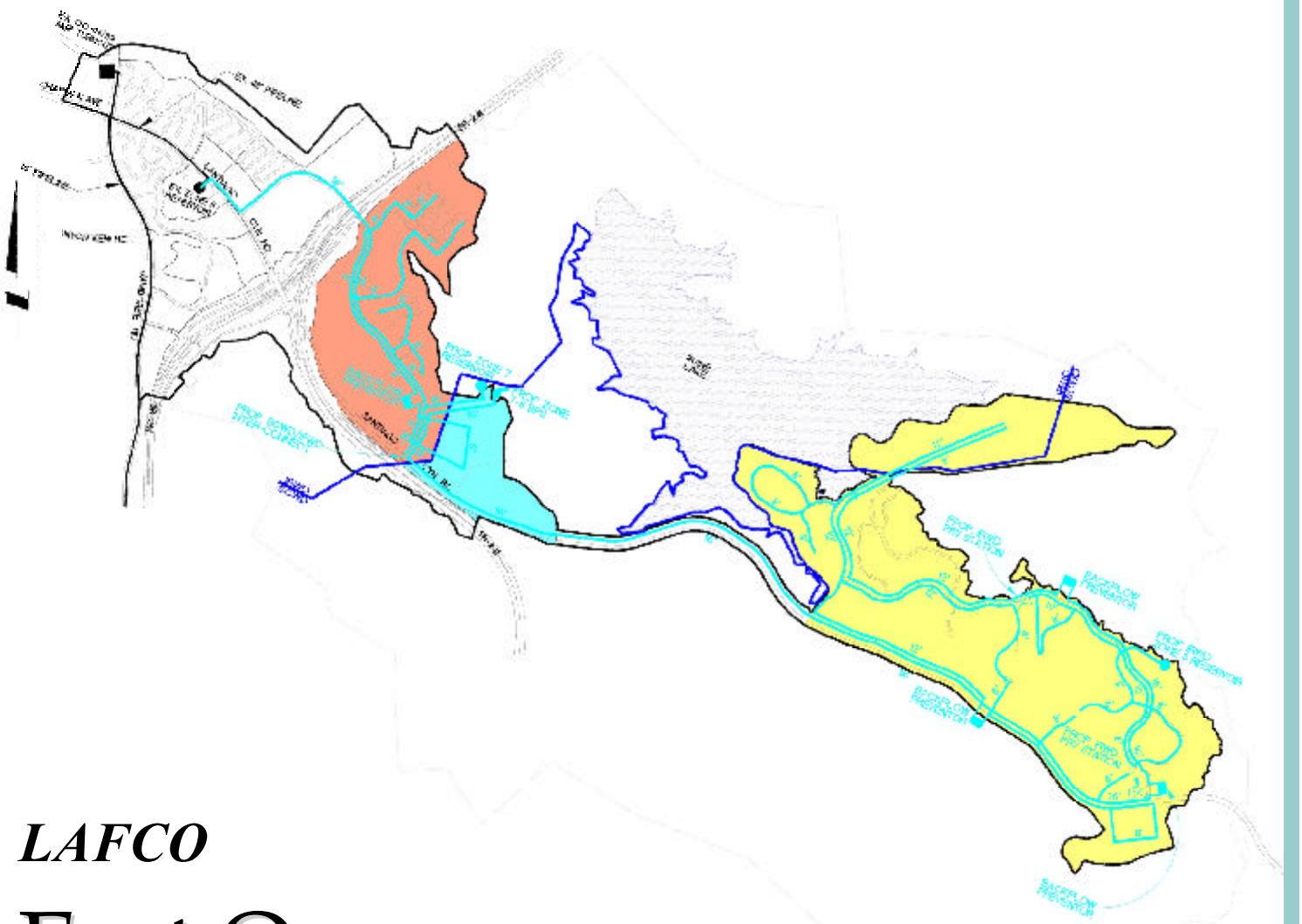
Appendix 7:
EAST ORANGE UTILITIES STUDY



LAFCO

East Orange Utilities Study

Prepared for
Orange County
LocalAgencyFormationCommission

Prepared by

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February 2005

East Orange Utilities Study
(East Orange Area I and East Orange Lake Village)

Prepared for:

Orange County
Local Agency Formation Commission
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Chapter 1
Introduction

1.1 Introduction

The Irvine Community Development Company (ICDC) owns a large area of property that is located within the City of Orange's sphere of influence. The portion of this property east of State Route 241, the Foothill Transportation Corridor, has been divided into two planning areas, called East Orange Area I and East Orange Lake Village. The majority of East Orange Area I is currently within the boundaries of Irvine Ranch Water District (IRWD). A small portion of East Orange Area I and all of the proposed East Orange Lake Village are currently within the boundaries of Santiago County Water District (SCWD). The location map (Figure 1-1) illustrates the location of the proposed development within the Districts' boundaries.

The City of Orange and ICDC are currently preparing an Environmental Impact Report (EIR) for this area. The EIR lists the options for the water and wastewater service provider to these two proposed development areas. IRWD and SCWD have both expressed a willingness and desire to provide municipal water and wastewater services to at least portions of the same development areas. It is LAFCO's responsibility to determine the best service provider to these new development areas. To assist the Orange County LAFCO in determining the most appropriate provider, The Keith Companies (TKC) was retained to objectively review the probable engineering and financial implications of the various service provider options.

1.2 LAFCO'S Roles and Responsibilities

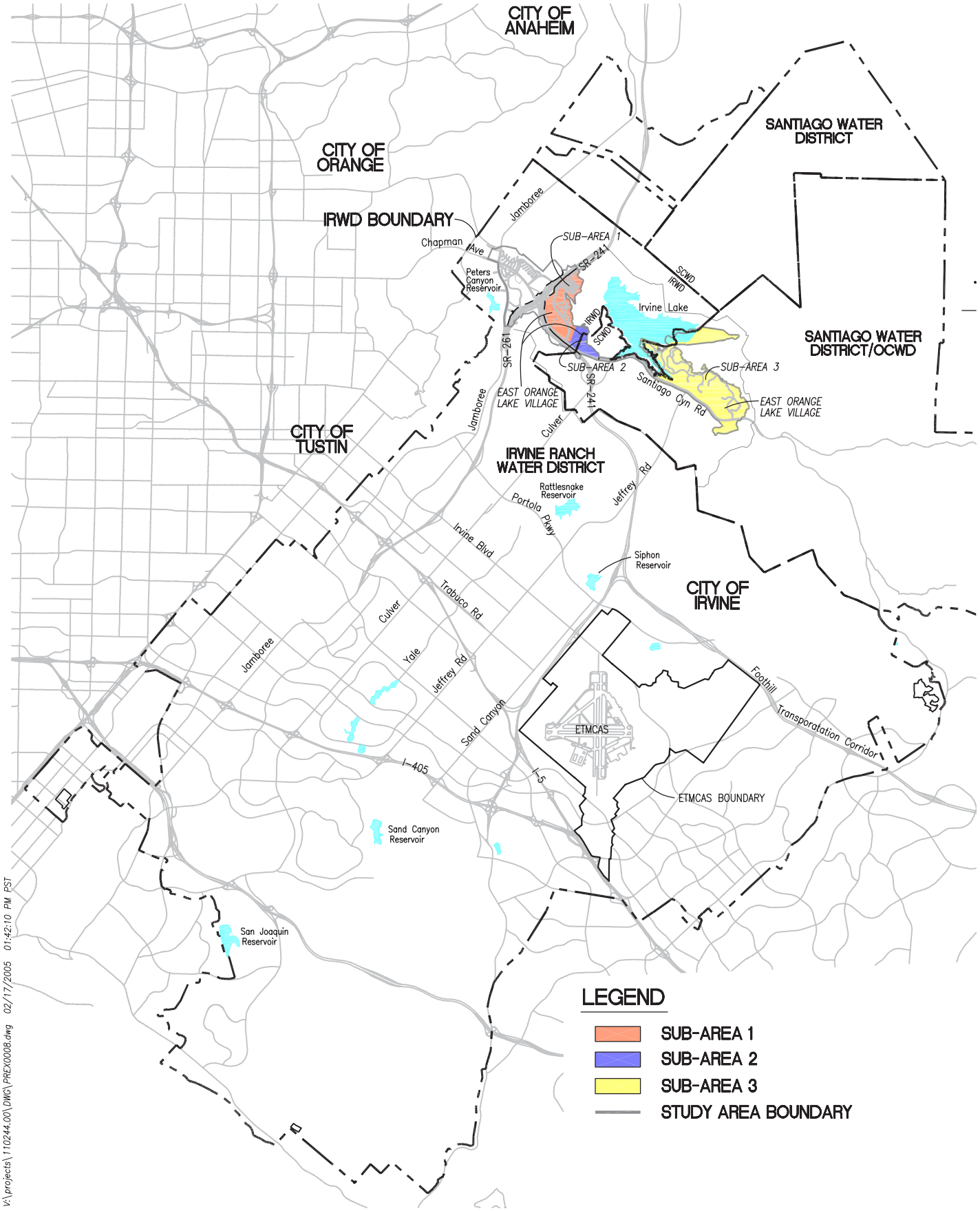
LAFCO is mandated by Government Code Section 56668 to thoroughly review plans for providing services and make determinations about logical and efficient jurisdictional and service boundaries that result in the most reliable and cost-effective delivery of services to the public. Excerpts from Government Code Section 56668 are attached as Appendix A to this report.

1.3 Potential Service Providers

As stated above, two governmental agencies have provided LAFCO with the desire to provide municipal water and sewer service to some or all of the proposed development sub-areas. The agencies are IRWD and SCWD. The boundaries for each agency are graphically shown in Figure 1-1. A brief description of each agency is provided below:

1.3.1 Irvine Ranch Water District

IRWD was established in 1961 and covers more than 133 square miles. IRWD serves a population of 316,000 in the city of Irvine; portions of the cities of Lake Forest, Newport Beach, Costa Mesa, Orange, Santa Ana and Tustin; and parts of unincorporated Orange County. As a special district, IRWD provides potable water,



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LOCATION MAP

FIGURE 1-1

sewage collection and treatment, and production of tertiary-treated water with the goals of providing the maximum efficiency and local responsiveness to its customers.

In 2003-04, IRWD delivered approximately 55,139 acre-feet of treated water, 7,986 acre-feet of untreated water and 21,167 acre-feet of recycled water. The District uses a total of 84,292 acre feet of water annually.

1.3.2 Santiago County Water District

SCWD was established in 1964 and is located in northeast Orange County, east of the cities of Orange and Tustin. SCWD covers an area of 29,450 acres with land ranging from foothills around Irvine Lake to mountainous canyons in the Cleveland National Forest. Presently, SCWD's single mission is to provide potable water to its customers.

SCWD has a current population of approximately 2,500 persons. The majority of the District's population is concentrated in Silverado and Modjeska Canyons. Currently, SCWD has 720 domestic water connections delivering up to 500 acre-feet of water annually.

Within SCWD there are two Improvement Districts (ID-1 and ID-2) that were formed in 1978 for the purpose of authorizing general obligation bonds.

1.4 References

TKC's analysis was based on the information provided in the following reports:

- Santiago County Water District's Water & Wastewater Master Plan Update, prepared by Psomas and dated October 2003. (SCWD Master Plan)
- Santiago County Water District's Water Supply Assessment, prepared by Psomas and dated December 29, 2003
- Irvine Ranch Water District's East Orange Lake Village Sub Area Master Plan, prepared by RBF Consultants and dated June 2004. (IRWD SAMP)
- Irvine Ranch Water District's Water Resources Master Plan, dated July 1999. (IRWD Master Plan)
- Irvine Ranch Water District's Amended Water Supply Assessment for Santiago Hills Phase II and East Orange Planned Communities Areas 1, 2 and 3, dated March 10, 2004.

Chapter 2
Study of Water Delivery Options

2.1. Overview of Alternatives

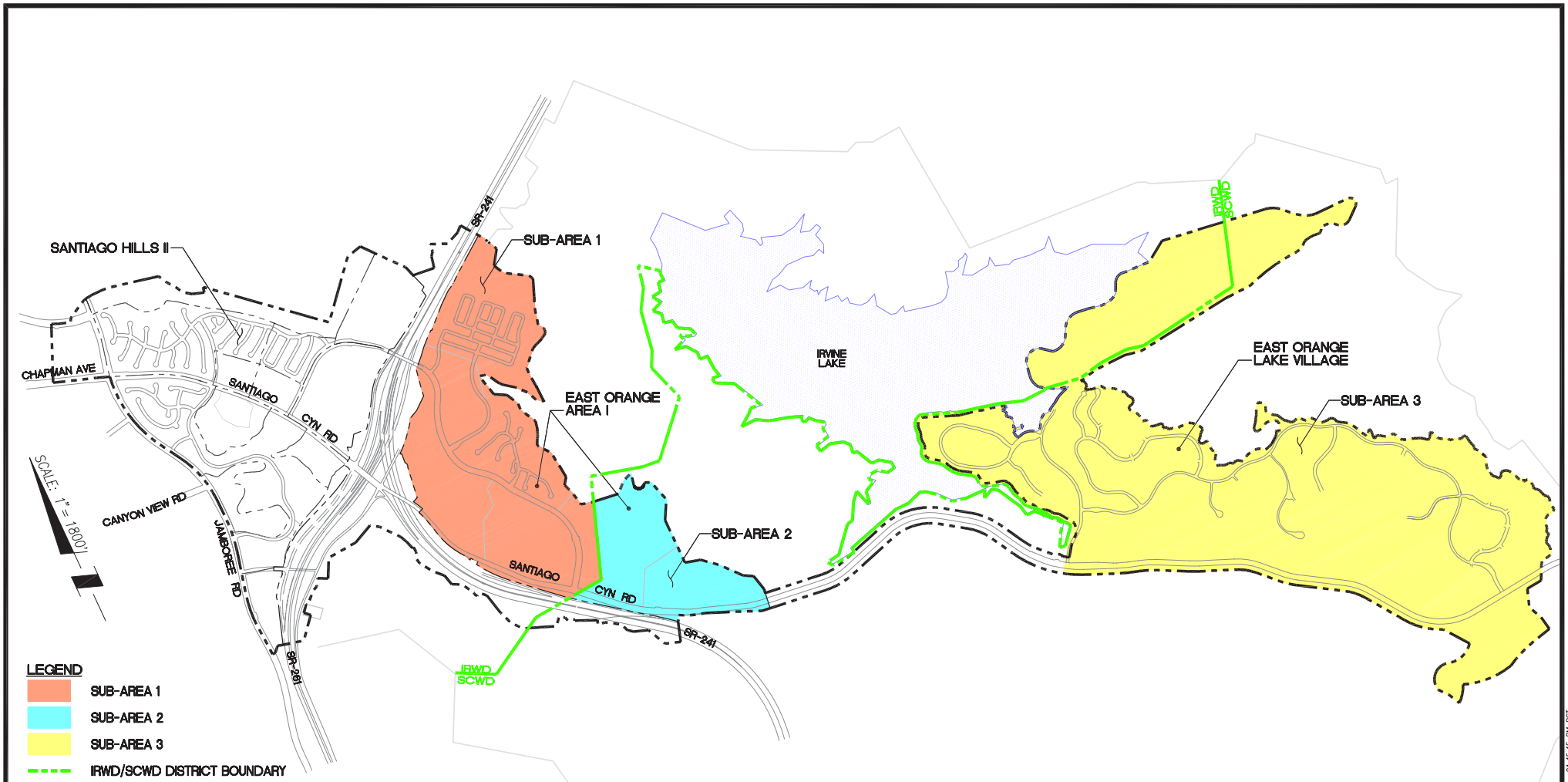
Based on the existing topography and proposed clustering of development, the study area is divided into two distinct areas that are separated by large areas of proposed open space. The planners at ICDC and the City of Orange call these areas "East Orange Area I" and the "East Orange Lake Village." Therefore, from an engineering perspective, it appears most appropriate to divide the study area into these two sub-areas.

The study area is also currently divided between two municipal retail water agencies. IRWD's current boundaries include the major portion of East Orange Area I. SCWD's current boundaries include the balance of East Orange Area I and all of East Orange Lake Village. Therefore, from a governance perspective, it appears most appropriate to divide the study area into these two sub-areas.

By overlaying the engineering and governance sub-areas, three study areas are generated. The first area, called Sub-Area 1, is the proposed development that is within both the existing IRWD service area and East Orange Area I. The second area, called Sub-Area 2, is the proposed development that is within both the existing SCWD service area and East Orange Area I. The third area, called Sub-Area 3, is the proposed development that is within both the existing SCWD service area and East Orange Lake Village.

Figure 2-1 provides an illustration of these sub-areas.

Based on the three sub-areas proposed for this study, the future land uses as proposed by ICDC are summarized in Table 2-1. The land uses shown are based on the data described in the IRWD Sub-Area Master Plan and the SCWD Master Plan. Land use density classifications assume the City of Orange's criteria for land uses.



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EAST ORANGE UTILITIES STUDY

SUB AREAS FOR ALTERNATIVE ANALYSIS

DATE: 01/04/2005

FIGURE 2-1

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Table 2-1 Proposed Land Use Summary		
Land Use	**Area, acres**	**Dwelling Units**
Sub-Area 1		
Residential – Low Density	137	350
Residential – Medium Low Density	97	400
Institutional	7	
SR -241/261 Caltrans ROW	114	
Open Space	69	-
Sub-Area 1 Subtotal	**424**	**750**
Sub-Area 2		
Residential – Low Medium Density	86	350
Sports Park	41	-
Sub-Area 2 Subtotal	**127**	**350**
Sub-Area 3		
Residential – Low Density	561	900
Residential – Low- Medium Density	83	350
Commercial Recreational [a]	218	100
Institutional	5	-
Santiago Reservoir	597	-
SR -241/261 Caltrans ROW	144	-
Open Space	4,176	-
Sub-Area 3 Subtotal	**5,784**	**1,350**
Study Area Total	**6,335**	**2,450**

a. Includes 100-room hotel

Based on communications with IRWD representatives, IRWD desires to provide retail water service to the entire study area. Based on communications with SCWD representatives, SCWD desires to provide retail water service to the proposed developments that are currently within their district boundaries. Therefore, three alternatives were investigated in this study.

The first alternative maintains the current water district boundaries. Sub-Area 1 would be served by IRWD, while Sub-Areas 2 and 3 would be served by SCWD.

The second alternative would extend IRWD's service area to include all of East Orange Area I, or Sub-Areas 1 and 2. SCWD would provide service to only East Orange Lake Village, or Sub-Area 3.

The third alternative would extend IRWD's service area to include the entire study area of East Orange Area I and the East Orange Lake Village. For this alternative, IRWD would provide services to Sub-Areas 1, 2 and 3.

Table 2-2 summarizes the service provider options that were analyzed:

Table 2-2 Water Provider Alternatives

Alternative	Description	Provider	Sub-Area
1	Existing Boundaries	SCWD	2, 3
		IRWD	1
2	SCWD- Lake Village &	SCWD	3
	IRWD – East Orange Area I	IRWD	1,2
3	IRWD – East Orange Area I	SCWD	-
	& Lake Village	IRWD	1, 2, 3

2.2 Evaluation Criteria for Study

To evaluate the three proposed alternatives, TKC utilized several criteria. These criteria relate to the level of service provided to the future residents and the overall cost to those residents. To measure the level of service, this study evaluated the reliability of the infrastructure and the ability of the service provider to manage the infrastructure. In addition this study addressed any anticipated negative impacts that the selected service provider would have on the other agency's existing facilities, assets and debts.

2.2.1 Reliability of Services

Each provider of water to the public is tasked with the responsibility of providing a reliable supply of water at a reasonable cost. The water resources engineering industry has many criteria to determine the reliability of a water distribution system. The water system proposed for this study area must meet or exceed the industry standards for reliability while meeting an appropriate level of service. The water industry's criteria used for this study are listed below.

- **Infrastructure Reliability**

  a. Redundancy in supply, sources, and type of water
  b. Reservoir storage capacity
  c. Distribution system redundancy
  d. Infrastructure/facility replacement program
  e. Emergency response capability
  f. Emergency interconnections
  g. Fire flow capabilities

- **Staffing Capabilities**

  a. Training/expertise
  b. Certifications
  c. Depth of available staff

- **Customer Service**

  a. Call response time
  b. Customer satisfaction indices
  c. Breadth of services (number of services/type)

- **Water Quality/Environmental Compliance**

  a. Frequency of violations
  b. Sampling frequency
  c. Quality control strategies

2.2.2 Total Cost to the Future Residents

As public agencies, one of the selected service provider's goals will be for this new area to be relatively revenue neutral. The future residents of the study area should not be required to assume the financial burdens of others within the district's overall service area unless there is a direct or indirect benefit to the future residents. Similarly, the existing customers should not be required to subsidize these future residents. To achieve this goal, both prospective service providers have divided their districts into improvement districts. With this method of cost accounting, the facilities required to service one improvement district are borne on the future residents of said improvement district. SCWD has established Improvement District No. 1 (ID-1) for the East Orange Lake Village. IRWD would also include the study area in one of their improvement districts or create a new improvement district. Therefore, this study assumed that the total estimated future costs to provide water service to the proposed developments will be borne on the future residents themselves, with residents paying for the system through their original property purchase price, their monthly water bills and their semi-annual property tax bills. For an equally reliable water distribution system, the service provider with the lowest estimated total cost will be the service provider that would be the most beneficial to the future residents.

The total cost to the future residents includes three major components: 1) capital costs, 2) financing and debt service costs, and 3) water, operation and maintenance costs. These are each described as follows:

1. Capital Costs

The water facilities that require significant financial resources may include wells, chlorination equipment, large diameter pipelines, reservoirs, booster pump stations, pressure reducing stations and backflow devices. Each water agency establishes its own policy for the financing of their water infrastructure. Some agencies require the developer to finance all of the capital costs. Other agencies provide all funding capital for the major water supply and transmission facilities.

Usually, smaller diameter water distribution pipelines that are routed throughout the local development streets are funded by the land developer.

2. Financing/Debt Service Cost

The capital costs expended to construct the major water transmission and supply facilities can be funded through various methods. Some water agencies issue municipal bonds to fund all of the capital facility costs. Other water agencies require the land developer to pay for some or all of these facility's costs. When this situation occurs, many of the developers work with a local government entity to establish a type of public financing mechanism, such as an assessment district or a community facilities district. With the land value as collateral, the bond payments are made from the proceeds collected from the individual property owners. The property owners can make payments through their semi-annual property tax bill or through their monthly water bill. Since the potential service providers have not supplied their proposed percentage of the capital costs that will be financed and the loan term, we have assumed that one half of the initial capital costs will be financed over a period of 20 years. Therefore, the costs to issue debt and the interest rate available to each agency are important components of the total cost to the future residents. In addition to the principal balance to be borrowed, this study will also address the interest rate that each agency would have to pay to finance that debt. Actual financing and interest costs will vary depending on the specific timing and amount of connection fees paid by home builders, and may be greater than shown to the extent that property-secured debt is required in advance of payment of connection fees.

3. Water, Operational and Maintenance Costs

Once the water distribution system is in place, the service provider will incur ongoing costs for the water supply, operations and maintenance of services and facilities.

The ongoing costs will include the cost of the treated water, the electricity costs to pump water to higher elevations, the repair and maintenance of the water distribution system, and the replenishment costs. The repair and maintenance components of the cost include both costs incurred for personnel and equipment.

When an agency extracts water from the Orange County groundwater basin, that agency must pay a fee for the water removed, called a replenishment fee. Since only a portion of the replenishment water into the basin is natural, one of the Orange County Water District's (OCWD's) major missions is to artificially recharge the basin. This is accomplished with spreading basins, importing water to recharge the basin, injecting water near the ocean to reduce seawater intrusion into the basin, and other projects. The costs to implement and operate these projects are paid by the replenishment fees. Since the study area will utilize

groundwater from the Orange County basin, the service provider must pay these fees to OCWD annually.

2.2.3 Impacts to Existing Water Systems and Districts

The following are miscellaneous evaluation criteria relating to the difference in existing infrastructure and overall agency impacts:

1. Bifurcation of District Service Areas

Prudent planning requires that future needs are considered when designing facilities under current conditions. Frequently new water distribution facilities are initially oversized to accommodate future anticipated needs. As mentioned earlier, both agencies have existing facilities in close proximity to the study area. Therefore, this study reviewed the existing facilities that each agency has in the vicinity to determine if any of these facilities was oversized in anticipation of the development of this study area.

For Alternative 1, neither of the existing water district boundaries is modified. However, Alternative 2 and Alternative 3 propose that a portion of SCWD's district would be annexed into IRWD. If either of these alternatives were implemented, SCWD's service area would be bifurcated. This study reviewed the financial impacts that may occur if SCWD were to lose a portion of its existing district territory. It may be possible that their financial viability would be threatened if a significant portion of their district were to be removed from their jurisdiction.

2. Secondary Financial Impacts to Agencies and Existing Customers

As stated above, the primary criterion used to evaluate the potential service provider options was the long-term lowest cost to the future residents of the study area, with the same level of service or better. However, this study also reviewed the financial impacts to the existing customers of SCWD and IRWD under the three service provider scenarios described in Section 2.1.

3. Transfer of Assets, Properties, Debt

One agency may own a parcel of property or water distribution facility that would not be needed if the other agency were to be the service provider. That asset may be of benefit to the other agency. However, it may also be the case that the asset does not have much value, but it would be equitable to attach the asset and its historical cost to the parcel of land being transferred.

2.3 Analysis of Alternatives

2.3.1 Water Demands

1. Average Day Demands

Both potential water service providers assumed the same land plan as shown in Table 2-1. They also used the same average daily water demand factors for each type of land use. The average daily demand factors are consistent with industry practice.

Multiplying the land uses by the water demand factors, both agencies' reports estimated the same average daily demand for the study area. Table 2-3 shows the estimated average daily demand by Sub-Area. Although this report assumes that all water demands will be met with potable sources, the potable and non-potable demands have been separated in the table.

Table 2-3 Estimated Average Water Demands by Sub-Area

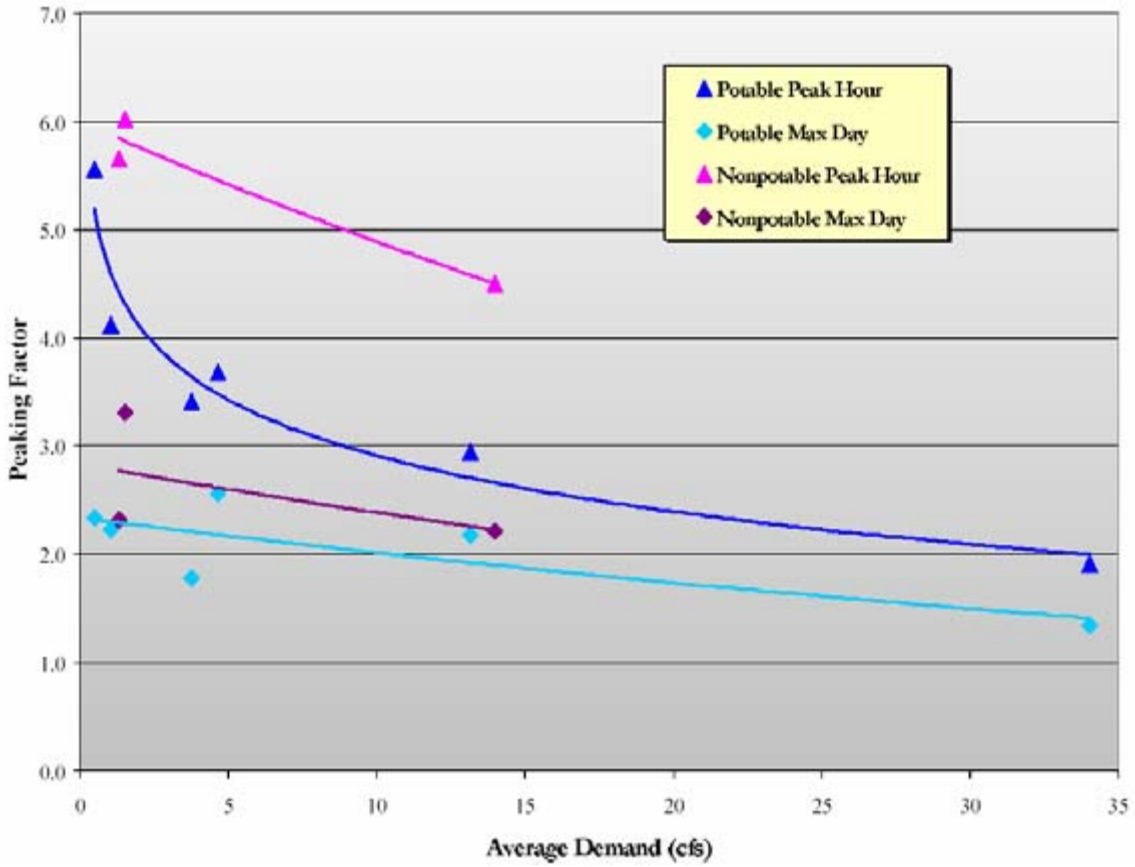
Land Use	Potable Demand (Gallons/Day)	Non-Potable Demand (Gallons/Day)
Sub-Area 1		
Residential – Low Density	210,000	
Residential – Medium Low Density	120,000	
Institutional	2,797	
Nat Trans		82,171
Ornamental Facilities		83,487
Fuel Modification Wet		25,517
Fuel Modification Thin		103,138
Sub-Area 1 Subtotals	**332,797**	**294,313**
Sub-Area 2		
Residential – Low Medium Density	105,000	
Sports Park		52,840
Sub-Area 2 Subtotals	**105,000**	**52,840**
Sub-Area 3		
Residential – Low Density	540,000	
Residential – Low- Medium Density	105,000	
Commercial Recreational [a]	27,995	
Institutional	1,998	
Lake Village - ICDC		375,985
Lake Village - Builder		264,136
Sectors 14 and 15		108,896
Sub-Area 3 Subtotals	**674,993**	**749,017**
Study Area Totals	**1,112,790**	**1,096,170**

a. Includes 100-room hotel.

2. Water Demand Peaking Factors

When analyzing water systems, water engineers study the ability of the distribution system to meet the critical water demand scenarios. One common critical scenario is to analyze the proposed system during peak hour demands. Another is to analyze the system when a fire flow demand is required during a day with maximum day demands. To perform these analyses, maximum day and peak hour peaking factors must be established, since the demands calculated are based a multiple of the average day demands. Therefore, TKC reviewed the proposed peaking factors from each agency.

TKC believes that the potable and non-potable maximum day peaking factors and peak hour factors assumed in the IRWD SAMP were factors that should be used when analyzing the district as a whole. Based on IRWD's Master Plan, these factors should be adjusted to the size of the distribution system being analyzed. The smaller the area being analyzed, the higher the peaking factors should be. From a statistical perspective, the smaller the sample size, the higher the probability that a larger percentage of the future residents are using their water at the same time. As the sample size increases, the probability decreases. Therefore, TKC increased all of IRWD's peaking factors based on Figure 3-6 of the IRWD Master Plan as appropriate for the study area. Figure 3-6 of their master plan is shown below for reference.



The maximum day peaking factor and the peak hour factor assumed in the SCWD Master Plan are slightly less than those assumed in the IRWD Master Plan. However, the values are similar and are within the industry standard range. A summary of the assumed peaking factors is shown in Table 2-4.

Table 2-4 Water Peaking Factor Comparison

	Maximum Day		
Source	**Potable**	**Non-Potable**	**Weighted Average**
SCWD Master Plan	2.25	2.25	2.25
IRWD SAMP	1.80	2.50	2.15
Revised IRWD	2.30	2.80	2.55
	Peak Hour		
Source	**Potable**	**Non-Potable**	**Weighted Average**
SCWD Master Plan	4.50	4.50	4.50
IRWD SAMP	2.50	5.00	3.74
Revised IRWD	4.70	5.80	5.25

2.3.2 Proposed Water Distribution Systems

The water distribution systems proposed in the SCWD Master Plan and the IRWD SAMP were analyzed based on the estimated water demands and peaking factors. Since SCWD's Master Plan assumed that only Sub-Area 3 would be served by SCWD, TKC added (or increased) the capacity of the proposed facilities as appropriate for Alternative 1. Since IRWD's SAMP assumed that IRWD would be the service provider for the entire study area, TKC deleted (or decreased) the capacity of the proposed facilities as appropriate for Alternatives 1 and 2.

1. Alternative 1 – Existing Boundaries

This study's proposed water distribution system for Alternative 1 is shown in Figure 2-2 and described below.

a. Proposed SCWD Water Facilities

SCWD would provide water service to Sub-Areas 2 and 3. The proposed system would include two sources of supply. A new water source would be required and proposed to be a groundwater well within the City of Orange. A new pipeline would be constructed within the city streets from the proposed well site to the existing 48-inch pipeline at the OC-68/69 Allen-McColloch Pipeline (AMP) turn-out. Additional imported water supply would be received from this turn-out from the Metropolitan Water District of Southern California's (MWD's) AMP transmission main. As SCWD currently has a capacity of 5.98 cfs from this

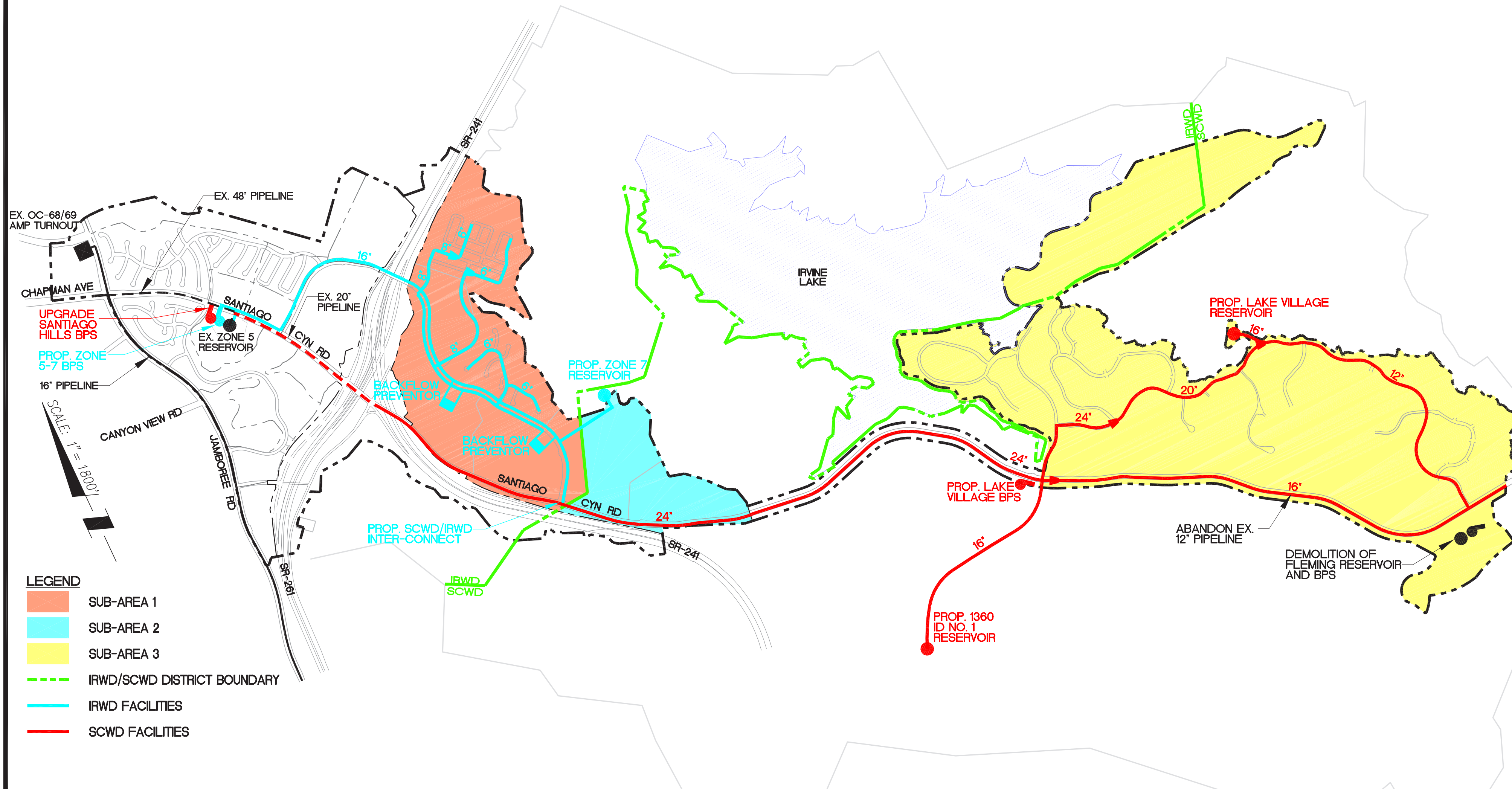


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			FIGURE 2-2	

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turnout until 2016, and could take 20 cfs in 2017 with the existing facilities, no modifications to the turn-out are required.

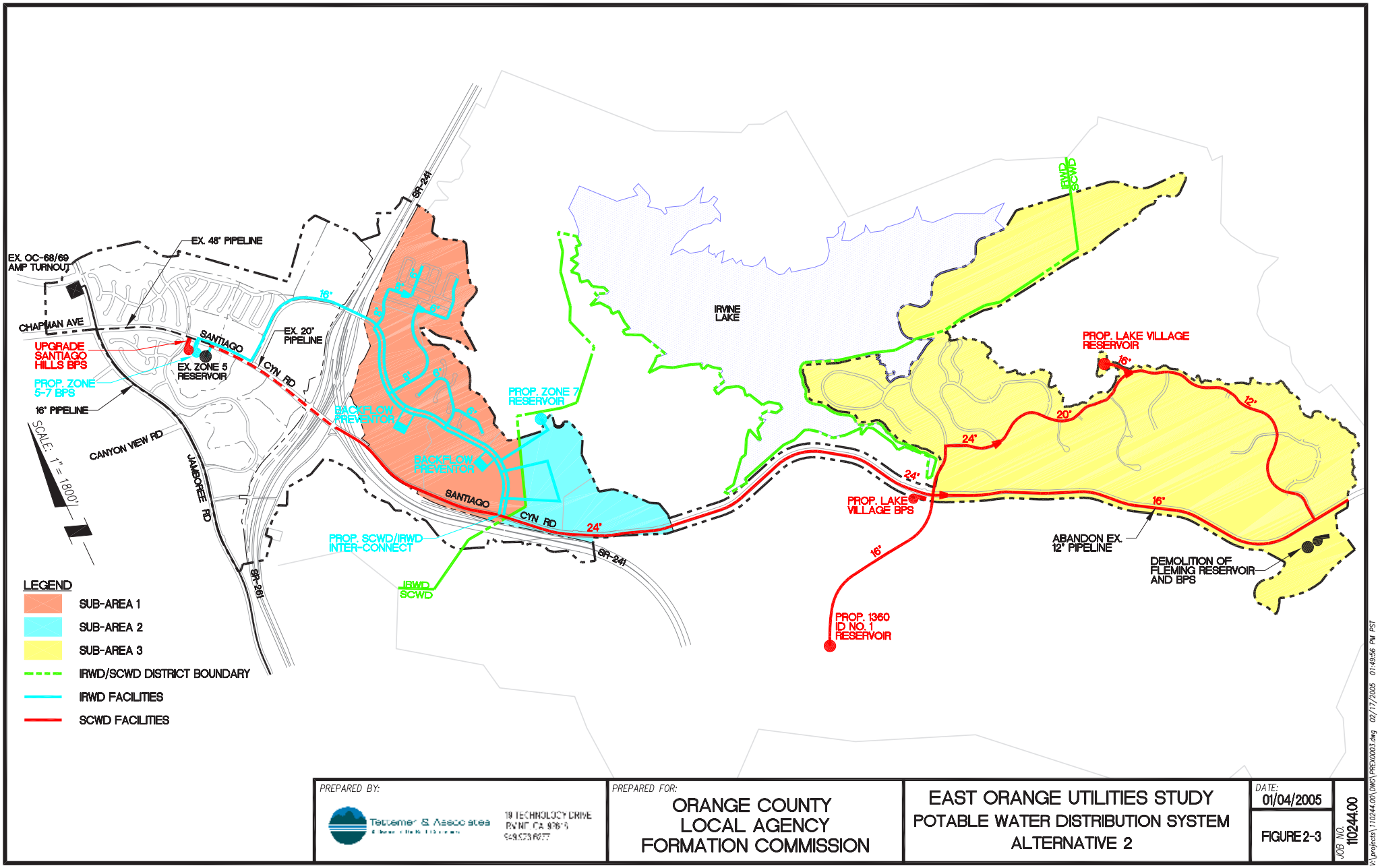
Sub-Areas 2 and 3 would be served by two pressure zones, the 1120 hydraulic grade line (HGL) distribution system and the 1360 HGL distribution system. The 1120 Zone would be served by two new reservoirs, and the 1360 Zone would be served by one new reservoir. The 1120 zone would require upgrades to the existing Santiago Hills booster pump station to increase the station's pumping capacity from 3.46 million gallons per day (mgd) to 4.34 mgd. The pump station upgrades would also increase the discharge water pressure from the ability to deliver water to the existing reservoir with a HGL of 1060 feet to deliver water to a proposed reservoir with a HGL of 1120 feet. The 1360 zone would require a new booster pump station to raise the gradient from 1120 feet to 1360 feet.

The existing 48-inch transmission main from the AMP turn-out to the existing Santiago Hills booster pump station and reservoir would be sufficient without any modifications required. A new 24-inch diameter pipeline would be constructed along Santiago Canyon Road from the existing Santiago Hills pump station to the existing 20-inch pipeline at the westerly side of the SR-241 corridor, and along Santiago Canyon Road from the existing 20-inch pipeline at the easterly side of SR-241 to the westerly entry road into the East Orange Lake Village. A 16-inch pipeline would be constructed along Santiago Canyon Road from this point to the easterly boundary of the study area. (The cost to construct the pipeline along Santiago Canyon Road would be allocated between the study area and the other SCWD improvement district.) A new 16-inch diameter pipeline would be required from the proposed pipeline along Santiago Canyon Road to the proposed zone 1360 reservoir. (A portion of the cost of this pipeline would also be allocated to development outside of the study area.) Also, large diameter pipelines would be required within Sub-Area 3 to loop the Santiago Canyon Road pipeline with the proposed zone 1120 reservoirs.

In addition, the existing Fleming booster pump station and reservoir would require demolition.

b. Proposed IRWD Water Facilities

IRWD would be the service provider to Sub-Area 1. One water pressure zone, the 1176 HGL zone (or Zone 7), would serve the sub-area. The proposed water distribution system would include a booster pump station and storage reservoir. It would also include a 16-inch pipeline from the proposed pump station to the reservoir. Additionally, IRWD funded non-potable pipelines and backflow preventors to legally connect the potable and non-potable pipelines would be routed through several of the residential streets. An inter-tie between SCWD and IRWD's water distribution systems would be constructed. Adequate supplies are available from the existing OC 68/69 AMP turn-out and the IRWD Jamboree Road pipeline. Therefore, no other off-site improvements are required.



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FORMATION COMMISSION

EAST ORANGE UTILITIES STUDY
POTABLE WATER DISTRIBUTION SYSTEM
ALTERNATIVE 2

DATE: 01/04/2005

FIGURE 2-3

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2. Alternative 2 – SCWD – East Orange Lake Village, IRWD – East Orange Area I

This study's proposed water distribution system for Alternative 2 is shown in Figure 2-3 and described below.

a. Proposed SCWD Water Facilities

SCWD would provide water service to Sub-Area 3. Similar to Alternative 1, the proposed system would include two sources of supply. The new water source would be a well within the City of Orange. A new pipeline would be constructed within the city streets from the proposed well site to the existing 48-inch pipeline at the OC-68/69 AMP turn-out. Additional imported water would be received from this turn-out to MWD's AMP transmission main. As SCWD currently has a capacity of 5.98 cfs from this turnout until 2016 and could take 20 cfs in 2017 with the existing facilities, no modifications to the turn-out are required.

Sub-Area 3 would be served by two pressure zones, the 1120 hydraulic grade line (HGL) distribution system and the 1360 HGL distribution system. The 1120 Zone would be served by two new reservoirs, and the 1360 Zone would be served by one new reservoir. The 1120 zone would require upgrades to the existing Santiago Hills booster pump station to increase the station's pumping capacity from 3.46 mgd to 4.01 mgd. The pump station upgrades would also increase the discharge water pressure from the ability to deliver water to the existing reservoir with a HGL of 1060 feet to the ability to deliver water to a proposed reservoir with a HGL of 1120 feet. The 1360 zone would require a new booster pump station to raise the gradient from 1120 feet to 1360 feet.

The existing 48-inch transmission main from the AMP turn-out to the existing Santiago Hills booster pump station and reservoir would be sufficient without any modifications required. A new 24-inch diameter pipeline would be constructed along Santiago Canyon Road from the existing Santiago Hills pump station to the existing 20-inch pipeline at the westerly side of the SR-241 corridor, and along Santiago Canyon Road from the existing 20-inch pipeline at the easterly side of SR-241 to the westerly entry road into the East Orange Lake Village. A 16-inch pipeline would be constructed along Santiago Canyon Road from this point to the easterly boundary of the study area. (The cost to construct the pipeline along Santiago Canyon Road would be allocated between the study area and other SCWD improvement district.) A new 16-inch diameter pipeline would be required from the proposed pipeline along Santiago Canyon Road to the proposed zone 1360 reservoir. (A portion of the cost of this pipeline would also be allocated to development outside of the study area.) Also, large diameter pipelines would be required within Sub-Area 3 to loop the Santiago Canyon Road pipeline with the proposed zone 1120 reservoirs.

In addition, the existing Fleming booster pump station and reservoir would require demolition.

b. Proposed IRWD Water Facilities

IRWD would be the service provider to Sub-Areas 1 and 2. One water pressure zone, the 1176 HGL zone (Zone 7), would serve both sub-areas. The proposed water distribution system would include a booster pump station and storage reservoir. It would also include a 16-inch pipeline from the proposed pump station to the reservoir. Additionally, IRWD funded non-potable pipelines and backflow preventors to legally connect the potable and non-potable pipelines would be routed through several of the residential streets. An inter-tie between SCWD and IRWD's water distribution systems would be constructed. Adequate supplies are available from the existing OC 68/69 AMP turn-out and the IRWD Jamboree Road pipeline. Therefore, no other off-site improvements are required.

3. Alternative 3 – IRWD – Entire Study Area

This study's proposed water distribution system for Alternative 3 is shown in Figure 2-4 and described below.

IRWD would be the service provider to Sub-Areas 1, 2 and 3. Two water pressure zones would serve the study area, with HGL's of 1176 feet (Zone 7) and 1259 feet (Zone 8). Two new reservoirs would be required, with one serving each zone. Two new booster pump stations would be required, with one pumping into each new pressure zone.

To maintain a range of water pressures within IRWD's service criteria, one sub pressure zone would also be established (Zone 8R). This sub-zone would be served by two pressure reducing valve (PRV) stations.

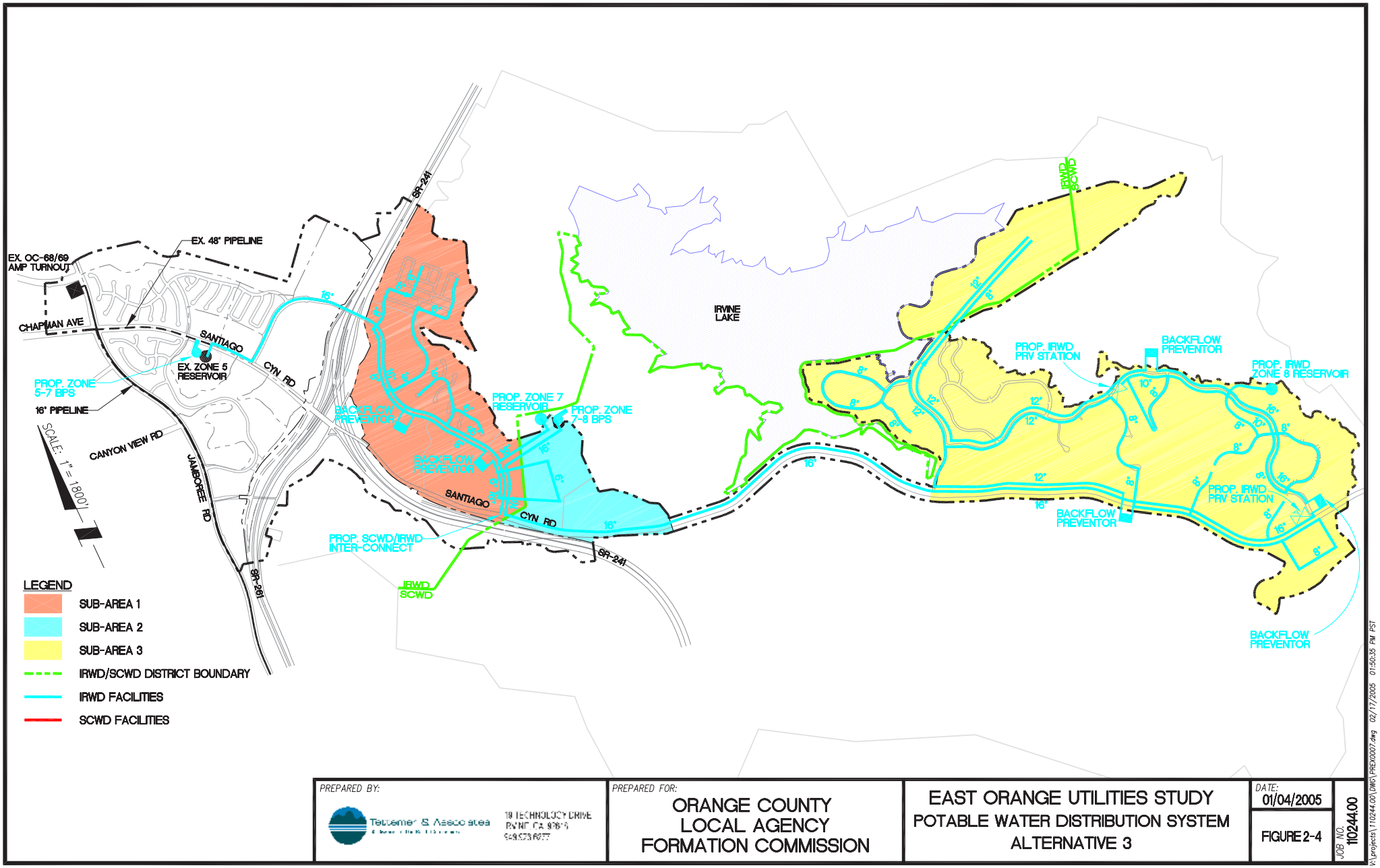
A new 16-inch pipeline from the proposed Zone 5-7 booster pump station to the proposed Zone 7 reservoir would be required. Also a 16-inch pipeline from the proposed Zone 7-8 booster pump station to the proposed Zone 8 reservoir would be required. In addition 12-inch pipelines would be routed through the proposed development. Similarly to Alternatives 1 and 2, IRWD funded non-potable pipelines and backflow preventors to legally connect the potable and non-potable pipelines would be routed through several of the residential streets.

2.3.3 Reliability of Services

1. Infrastructure Reliability

a. Redundancy in Supply, Sources and Type of Water

If SCWD were to provide water service to the study area, their sources of supply would include local groundwater treated at the Manning Water Treatment Plant, groundwater from the Orange County groundwater basin, and MWD imported water from the AMP. Based on their Water Supply Assessment, SCWD proposes to serve their demands with 6 percent from local sources treated at the Manning



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ORANGE COUNTY
LOCAL AGENCY
FORMATION COMMISSION

EAST ORANGE UTILITIES STUDY
POTABLE WATER DISTRIBUTION SYSTEM
ALTERNATIVE 3

DATE: 01/04/2005

FIGURE 2-4

JOB NO. 110244.00

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Water Treatment Plant, 48 percent groundwater from the Orange County basin, and 46 percent imported water.

SCWD has rights to 300 acre-feet per year from the Manning Water Treatment Plant. However, this source is dependent on the local rainfall. In wet years, the district has produced as much as 230 acre-feet per year from this source, with an average of 165 acre feet per year. The water production from this source was negligible in 2001, but more than 200 acre-feet per year in 2002.

Since the East Orange Lake Village is within the OCWD service area, SCWD would utilize groundwater to the maximum extent possible. Although this groundwater basin is currently in an overdraft condition, OCWD is proactively addressing this issue by undertaking programs to replenish the basin, such as adding and improving water recharge basins, making improvements to the seawater intrusion control barrier, and constructing their Groundwater Replenishment System program as a joint effort with the Orange County Sanitation District. OCWD sets the maximum volume of water that can be extracted from the Orange County groundwater basin on an annual basis. The allowable volume is based on the percentage of each member agency's total water demands that can be met with groundwater, called the basin pumping percentage. For example, if the basin pumping percentage is set at 75 percent, up to 75 percent of the water demands can be met with groundwater supplies. The remaining demand must be met by imported or local water supplies.

As stated earlier, SCWD and IRWD currently have a joint turn-out from the MWD's AMP. This transmission main is supplied with a blend of Colorado River water and the State Water Project water. Currently SCWD has a capacity of 5.98 cfs from this water source. Originally SCWD had a 20 cfs capacity, but the down sized planned development within their boundaries made the original higher capacity unnecessary. However, additional water could be received if needed by paying additional costs to the Municipal Water District of Orange County, a MWD member agency.

An existing 48-inch diameter pipeline, called the Santiago Canyon Road Pipeline, is routed from the turnout to the Santiago Hills/Zone 5 reservoir. Based on the 1985 *Agreement for Joint Construction of the Santiago Canyon Road Pipeline*, SCWD owns 28.7 cfs capacity in the pipeline and IRWD owns 30.0 cfs of the capacity. Therefore, both the turn-out and the transmission pipeline have an adequate capacity to deliver the required flows to the proposed development.

Therefore, SCWD has three district-wide sources of supply to meet their projected water demands.

IRWD has an even more diverse portfolio of water supplies. Although IRWD does not allocate particular supplies to any project area, many water sources of supply would be available to the study area. By the time that the proposed

development within the study area is completed, IRWD will have supplies that include their deep aquifer treatment system (DATS), their Irvine Desalter Project (IDP), groundwater from the Orange County groundwater basin and imported water from MWD. DATS can produce 7,200 acre-feet per year. IDP will be able to supply 5,568 acre-feet per year. The Irvine Subbasin will supply 4,800 acre-feet per year. During a normal year, the Orange County groundwater basin will yield 28,000 acre-feet per year. MWD can supply 49,916 acre-feet per year, with a current capacity at the closest AMP turn-out of 5.0 cfs. In addition to these water supplies, IRWD has untreated and native water supplies from Irvine Lake and reclaimed water from Michelson Wastewater Reclamation Plant. With these diverse sources and additional wells proposed for west Irvine, IRWD projects the supply sources to be approximately 20 percent more than their ultimate water demands.

Based on this groundwater capacity and the existing facilities and rights to imported water, all three alternatives provide an adequate redundancy in supply, sources and type of water. However, it appears that due to their size, IRWD has more diverse sources of supply available to the study area.

b. Reservoir Storage Capacity

For relatively isolated water distribution systems, like that required for the study area, it is typical and prudent engineering for the reservoir storage capacity to provide for fire flow demand storage, emergency storage and operational storage. Both potential water service providers used this same methodology to size their reservoirs in their planning reports. The fire flow demand storage is equal to the volume of water required to support the worst–case predicted fire fighting effort. The emergency storage is usually equal to one maximum day demand. The operational storage is usually a percentage of the maximum day demand with the percentage ranging from 17 to 30 percent.

Based on the proposed land plan, a 100 room hotel and a golf clubhouse are planned near Irvine Lake. This will be served by either SCWD's 1120 Zone or IRWD's Zone 8R. The fire flow storage volume required to protect this facility is 1.92 million gallons. This volume is based on the East Orange Water Supply Study, June 2004 and is determined by multiplying the required flow rate by the required duration (8,000 gallons per minute x 60 minutes per hour x 4 hours.) Therefore, the proposed reservoir sizes for the SCWD Zone 1120 reservoir and the IRWD Zone 8 reservoir were increased to accommodate this storage volume.

Both agencies use one maximum day demand for their emergency storage component. IRWD uses their district-wide maximum day peaking factors when calculating reservoir storage. Excess storage capacity could produce water quality problems if the water was stored in their reservoirs for too long of a period. Since their domestic and non-potable peaking factors would produce a weighted average factor of 2.30, this would be comparable to SCWD's peaking factor of 2.25. Therefore, this district-wide weighted average peaking factors was used to

compute IRWD's required reservoir storage and SCWD's was used to calculate their required storage volume.

SCWD computes their operational storage to be 25 percent of the maximum day demand. Based on IRWD's Water Resources Master Plan, IRWD's operational storage should be equal to 23 percent of the maximum day demand. Since these factors were materially the same as each other, were consistent with their master plans and with industry standard, each agency's operational storage percentage was used for their proposed system.

When reviewing IRWD's SAMP, it appears that no storage was provided for the non-potable demands in the proposed gravity feed system. Although IRWD would provide the Zone 7 non-potable operational storage in their Zone 5 reservoir, TKC added the non-potable operational storage to the potable storage requirements to determine the total reservoir storage capacity to equal the reliability proposed by SCWD. Based on the IRWD Water Resources Master Plan, the operational storage for non-potable demands was calculated to be 23 percent of the maximum day demand.

Based on this data and criteria, the proposed reservoirs were sized for each alternative. Table 2-5 shows the total required storage volume of each reservoir that would be required for each agency for each alternative. The total proposed storage was obtained by rounding the total required storage volume to two digits. Typically, reservoirs are built to contain rounded volumes.

Table 2-5 Water Reservoir Sizing

Alternative	Agency	Water Pressure Zone	Potable Oper. Storage MG	Non-Potable Oper. Storage MG	Local Emerg. Storage MG	Fire Flow MG	Total Required Storage MG	Total Proposed Storage MG
1	SCWD	1120	0.75		2.99	1.92	5.66	5.70
	SCWD	1360	0.11		0.45	0.18	0.74	0.74
	IRWD	1176 (7)	0.13	0.19	0.60	1.92	2.84	2.80
	Total							**9.24**
2	SCWD	1120	0.66		2.63	1.92	5.21	5.20
	SCWD	1360	0.11		0.45	0.18	0.74	0.74
	IRWD	1176 (7)	0.18	0.22	0.79	1.92	3.11	3.10
	Total							**9.04**
3	IRWD	1176 (7)	0.18	0.22	0.79	1.92	3.11	3.10
		1259 (8)	0.28	0.48	1.21	1.92	3.89	3.90
	Total							**7.00**

With these proposed reservoir storage volumes, all three alternatives provide an adequate reservoir storage capacity. Based on the SCWD Master Plan, two Zone 1120 reservoirs and one Zone 1360 reservoir are proposed by SCWD. All three

of these tanks are proposed to be constructed of welded steel. Welded steel reservoirs need to be taken out of service approximately every five to seven years for inspection and possible re-coating. Therefore, it is prudent for SCWD to propose two tanks for the larger 1120 zone. However, redundant storage is not proposed by SCWD. Therefore, the reliability for Alternatives 1 and 2 is slightly better in the low demand months, but not during the peak demand months.

c. Distribution System Redundancy

All three alternatives provide looping piping distribution systems to the maximum extent practical. If one segment of pipeline is out of service, the isolation valves can be closed to route the water through other pipelines around the line break to minimize the number of homes and/or fire hydrants that are out of service.

The proposed booster pump stations would all have redundant pumps and motors. This would allow the pump station to function with one pump and motor out of service. The stations would also have the capacity to connect portable generators if power were interrupted to the stations.

Based on these design features, all three alternatives would provide distribution system redundancy.

d. Infrastructure/Facility Replacement Program

The operating costs estimated in our analysis contain a component to replace the infrastructure as it reaches the end of its useful life. Assuming that these rate structures are adopted, the infrastructure/facility replacement program should be adequate for all alternatives.

e. Emergency Response Capability

The cost estimates prepared in this analysis assumed that the proposed water distribution facilities will include telemetry. This system will allow constant, real time communication between the proposed pump stations, reservoirs and pressure reducing stations.

SCWD's headquarters are in close proximity to the study area. IRWD maintains some of their operations functions at the Rattlesnake Reservoir. Since both of these facilities are in close proximity to the study area and would equip the major facilities with telemetry, it appears that either potential service provider would provide an adequate response time.

f. Emergency Interconnections

SCWD currently has an interconnection with Trabuco Canyon Water District at the southeast boundary of their district. However, due to the hydraulics and small diameter existing pipelines in the area, the potential exchange volume is limited. At the other end of the district, they currently can obtain water from IRWD at the Santiago Hills reservoir and booster pump station.

IRWD proposes to obtain imported water from the AMP connection northwest of the study area. They can also obtain water from their existing system along Jamboree Road. In addition, IRWD proposes to construct an inter-tie between SCWD and IRWD within the study area. The proposed HGL of SCWD's distribution system is 1120 feet. IRWD proposed to construct a water pressure zone with an HGL of 1176 feet. The pressure differential between these two zones is approximately 24 psi. Therefore, during conditions of normal operations, water would not be able to flow freely between the districts. However, water could flow through a pressure reducer from IRWD to SCWD at any time. If an emergency were to occur within IRWD's proposed distribution system, the water pressure would drop significantly so that water could flow from SCWD to IRWD. Since the required water pressure of 20 psi during fire flow demands is substantially lower than the normal pressure range of 40 psi to 100 psi, this inter-tie would be valuable during an emergency.

Based on these existing and proposed facilities, all alternatives would provide adequate emergency interconnections.

g. Fire Flow Capabilities

For all three alternatives, all distribution facilities were sized to provide adequate fire flow capabilities. The pipelines, reservoirs and pump stations were designed to provide the required fire flow duration and rate at an adequate water pressure.

2. Staffing Capabilities

At the present time, it appears that both SCWD and IRWD are adequately staffed. The State of California Department of Health Services requires water purveyors to employ water operators that are properly trained and maintain their operators certificates. Since both of these agencies currently provide water service, their staffs are fully capable of providing the required expertise in the future. Also, the operating budgets proposed in this study provide adequate funding for the proper personnel costs.

3. Customer Service

Based on our limited research, it appears that SCWD and IRWD provide reasonable call response times to their existing customers. We are not aware of any lack of customer satisfaction. The study area would increase the customer

base of IRWD by approximately two percent. However, it would increase the customer base of SCWD by more than three fold. It would appear logical that SCWD would be required to add staff to properly serve the new customers. The proposed fees charged to the customer should include compensation to the district for these additional costs.

4. Water Quality/Environmental Compliance

Based on our limited research, we were not aware of any significant violations related to water quality by either agency. To our knowledge, the water quality samples are collected by each district in compliance with the State Department of Health Services.

2.3.4. Total Costs to the Future Residents

1. Capital Costs

The reference reports provide each agency's representation of the major water transmission and distribution facilities that will be required to properly serve the study area. Neither report comprehensively describes the small diameter distribution pipelines, as their locations and lengths cannot be known until the final engineering and street improvement plans are prepared. Since these small diameter pipelines cannot be determined and will be funded directly by the land developer, they have been excluded from this analysis.

IRWD and SCWD have water distribution facilities in close proximity to the study area. However, neither agency has on-site facilities in place to serve the proposed development. Therefore, each prospective service provider would be required to construct new facilities and/or upgrade existing facilities to meet the operational needs of the study area.

The construction costs per linear foot of pipeline were computed based on the unit costs shown in Table 2-6. As footnoted, the unit cost per foot was increased for pipelines that would be constructed in existing roads. This addition cost represents the additional work required for traffic control, the removal and replacement of existing asphalt, and possible shorter working hours per day.

Table 2-6 Domestic Pipe Unit Costs [a]	
Diameter, inches	**Construction Cost, $/LF**
6	40
8	50
10	65
12	75
16	100
20	125
24	150
36	220

a) $20/LF was added to the unit cost for pipes that will be constructed in existing streets.

Neither agency supplied detailed cost data for their proposed booster pump stations. To determine appropriate costs, TKC estimated the approximate power requirements of each station. The horsepower is calculated by multiplying the required pump flow rate by the required discharge pressure. This product is then divided by the efficiency of the pump station and a conversion factor. Once each station's required horsepower was computed, an additional pump was added to the station to provide redundancy. The total station horsepower was multiplied by the capital cost per horsepower as shown in Table 2-7.

Table 2-7 Estimated Unit Costs of Booster Pump Stations	
Horsepower	**Construction Cost, $/hp**
100	11,300
150	8,100
200	6,500
250	5,400
300	4,700
400	3,700
500	3,100
1000	1,800
1500	1,300

Calculations to approximate the required horsepower for each station are included in Appendix B.

SCWD's existing Santiago Hills booster pump station was completed approximately five years ago. Based on conversations with SCWD, no detailed engineering studies have been performed to determine the required upgrades. Without this study it is not possible to accurately estimate the construction costs to upgrade this station. Since the station is relatively new and the proposed flow

rate and discharge pressure are of the same order of magnitude as the existing station, TKC assumed that the construction cost would be $1 million less than if a new station were built.

The cost to construct the proposed reservoirs and their related site improvements used a uniform cost of $1.25 per gallon. In reality, the cost per gallon should decrease incrementally as the volume of the reservoir increases. However, all proposed reservoirs in the analysis would have volumes of the same magnitude. Therefore, they should have similar costs per gallon. IRWD proposes to construct post-tensioned concrete reservoirs. SCWD would construct two welded steel tanks for the 1120 Zone and one for the 1360 Zone. The additional piping, grading and other costs for two tanks for one pressure zone would be offset by the probable higher construction costs for concrete tanks.

The construction costs do not include the costs to acquire land or easements. Normally ICDC transfers the required property to the water agency without charge. In return, the water agency attempts to make the facility as aesthetically pleasing as possible. Also, the property that is used for pump station and reservoir sites is typically difficult to develop. Therefore, the land value is not as high as the developable area. Some of potential reservoir sites may be within the Natural Community Conservation Planning (NCCP) program area. The construction costs also do not include the costs to "take" from the NCCP. It is our understanding that both potential service providers have purchased "take" in advance of this project. Therefore, no additional costs would be incurred for any of the alternatives.

The construction costs for the pump stations and reservoirs also do not include piping cost to the facilities. These costs are included in the linear footages of pipe.

Based on our analysis, TKC estimated opinions of probable capital construction costs for the three alternatives. The detailed computations are provided in Appendix B. The costs are summarized as follows:

Table 2-8 Estimated Total Capital Water Costs, dollars

Service Provider	Alternative 1	Alternative 2	Alternative 3
SCWD	$ 24,980,830.	$ 24,137,130.	$ 0
IRWD	$10,320,450.	$ 11,084,550.	$ 28,464,975.
TOTAL	**$35,301,280**	**$ 35,221,580.**	**$ 28,464,975.**

Table 2-9 Estimated Capital Water Costs per Dwelling Unit, dollars			
Service Provider	**Alternative 1**	**Alternative 2**	**Alternative 3**
SCWD	$ 16,013.	$ 19,310.	$ 0
IRWD	$ 15,519.	$ 11,369.	$ 12,793.
TOTAL	**$ 15,866.**	**$ 15,830.**	**$ 12,793.**

The capital costs for Alternative 3 are materially lower than the other two alternatives. Several reasons were noted for the lower capital cost. These include the following:

- IRWD plans to install a dual pipeline system. The non-potable demands would be served by separate non-potable pipelines. Backflow prevention devices and isolation valves would separate the piping systems. If an emergency were to occur that would interrupt the water supply to the study area, the isolation valves could be closed to eliminate non-potable water usage during the emergency. With this strategy, IRWD does not propose to include non-potable emergency storage in their proposed reservoirs. This is the same criterion that is used in their stand-alone non-potable water storage calculations. This piping configuration would reduce the reservoir storage cost by approximately $3.8 million.

- IRWD currently operates many wells to extract groundwater from the Orange County basin. These wells have a greater capacity than their current production rates. Their production rates are limited by the maximum basin pumping percentage allowed by OCWD. If IRWD were to serve the East Orange Lake Village, they would increase the operation of their existing wells. Therefore, no new wells and no new pipelines would be required to supply groundwater to the study area. SCWD does not currently own or operate any wells within the Orange County groundwater basin. Therefore, SCWD would be required to drill and equip a new well and install a water transmission main from the well site to their existing AMP turn-out. This would add approximately $3.8 million to the project if SCWD were the service provider.

- Since SCWD would be modifying water pressure zones to accommodate this project, two of their existing facilities would need to be demolished. The demolition would cost an additional $170,000.

Upon review of the capital costs, the total costs for Alternative 1 and Alternative 2 are very close. Sub-Area 2 is a small portion of the study area, with 350 dwelling units planned for construction. Also, SCWD and IRWD would have water facilities in close proximity to the sub-area as each would be serving an immediate adjacent sub-area. Therefore, it appears reasonable that their total costs are similar.

Although Alternative 3 is estimated to have a lower capital cost than the other alternatives, Alternatives 1 and 2 would realize cost savings from the following:

- Since SCWD owns the Santiago Hill booster pump station, the modifications to this station would be significantly less than the construction of an entire new station. Therefore, cost savings would be realized by utilizing this pump station.

- In addition to the study area, SCWD's proposed transmission mains along Santiago Canyon Road would be utilized in the future by their ID-2 area and also by the remainder of the district. A portion of the capacity of this pipeline would then be allocated to these areas. Therefore, this capacity sharing would allow cost sharing that would reduce the costs allocated to the study area.

2. Financing/Debt Service Cost

This study assumed that the capital costs would be financed through a combination of connection fees and general obligation debt funded by improvement district property taxes paid by the new development. The East Orange Lake Village area currently falls within ID-1 in SCWD. IRWD also utilizes improvement districts to fund debt service, along with connection fees in order to distribute the burden between the developer and the home owner. For this study, we have arbitrarily assumed that one half of the capital costs with be funded through connection fees and one half will be funded by the issuance of debt.

IRWD minimizes its costs for debt issuance by consolidating issuances for multiple improvement districts. They typically combine issuances in the range of $50 million to $70 million. The District recently was assigned an AA rating. This rating will reduce the costs associated with preparing a debt issuance, and it will help assure favorable rates. SCWD's last debt issuance was in 1994. The amount remaining of $1,940,500 was recently refinanced at a fixed rate over a term of 20 years.

It is probable that IRWD could obtain more favorable rates than SCWD due to IRWD's ability to consolidate multiple, large debt issuances, its AA rating, its previous credit history, and the magnitude of its revenue base. Since SCWD's required rate cannot be determined without extremely expensive financial analysis by a rating service, it was assumed that both districts would finance the capital improvements under similar terms. Assuming IRWD's average variable finance rate of 3.75 percent, financing half of the capital costs using debt would add approximately 78 percent more in total costs over the 25 year term for all alternatives than if all capital costs per paid by cash immediately.

The finance charges increase the cost differences between the alternatives described earlier. For example, the average capital costs per unit for Alternatives

1 and 2 are similar, and the corresponding annual debt service payment per unit is similar at about $500 per unit per year, averaged over both water districts. The capital costs for Alternative 3 are significantly lower, and the corresponding annual debt service payment is $400 per unit per year, with lower capital and interest components.

3. Water, Operational and Maintenance Costs

The cost to deliver potable water to the future customers includes several components. Besides the costs to install the infrastructure to deliver the water, the costs to the customer include the cost of water, and the cost to operate, maintain and replace the infrastructure.

Due to the relatively small scale of the study area in comparison to IRWD's total service area, it is unlikely that the additional service area would significantly affect the District's average cost of water, operating costs and rate structure. It is IRWD's policy to charge all of their customers the same water rates, regardless of the source of supply to a particular area. Even though some regions receive more groundwater than other regions of the district, IRWD blends all water costs into one district-wide rate. Based on IRWD's current rates, the average charge per residential unit would be approximately $200 per dwelling unit per year. Actual costs will depend upon specific operational characteristics of the new systems, which have not been estimated as a part of this analysis. However, the lower-cost system associated with Alternative 3 generally should incur lower maintenance and replacement costs.

The new development would represent a significant increase in SCWD's revenues relative to its existing customer base, and provide the opportunity to achieve economies of scale. While variable operating costs are likely to grow, the General and Administrative (G&A) costs may remain relatively fixed and can be spread over the increased rate base. The result will be an increase in net revenue to the District, or a reduction in required rates from the new development. For example, rather than requiring the current average annual charge of $680 per unit, G&A economies of scale could reduce the required charges to the new development to $300 per unit annually. Distributing the savings among all SCWD customers would generate a savings of 10 to 15 percent for existing customers. Actual savings will vary, and will depend on the future staffing and other operating and G&A costs that are incurred to serve the study area.

2.3.5 Impacts to Existing Water Systems and Districts

1. Bifurcation of District Service Area

After review of the SCWD Master Plan, it appears that SCWD may have initially oversized the following existing facilities in anticipation of future demands:

- The jointly owned OC-67/68 turn-out to Metropolitan Water District of Southern California's Allen McColloch Pipeline.
- The jointly owned 48-inch diameter transmission main from OC-67/68 turn-out to the Santiago Hills reservoir and booster pump station.
- The 20-inch transmission main that is routed along Santiago Canyon Road across State Route 241.

The OC-67/68 AMP turn-out and 48-inch transmission main were jointed funded by IRWD and SCWD when ICDC planned a much larger development in the East Orange area. As stated in previous sections, SCWD has a capacity of 5.98 cfs from this turn-out. SCWD currently owns 28.7 cfs capacity in the Santiago Canyon Road Pipeline, which is routed from the turn-out to the Santiago Hills/Zone 5 reservoir. If SCWD were to be the service provider to all areas that are currently within their boundary, their maximum day demands through this turn-out and pipeline would be approximately 5.29 cfs. Therefore, regardless of the service provider to the study area, SCWD will have excess capacity in previously constructed facilities.

If IRWD were to serve Sub-Areas 2 and 3 (Alternative 3), SCWD's 20-inch diameter transmission main under the toll road would be oversized for their ultimate needs. This may be a cost that was expended in anticipation of the East Orange Lake Village.

We were told by representatives of SCWD that a bifurcation study was prepared by the district. However, this document was a draft internal document that was not intended to be distributed outside of the district. Therefore, we cannot conclude that any costs would be incurred by SCWD except for excess capacity in the AMP turn-out, the existing 48-inch Santiago Canyon Road Pipeline and the 20-inch pipeline under SR-241. Since ICDC's proposed development will be much less intensive than was originally proposed, the turn-out and 48-inch pipeline will be oversized regardless of the chosen service provider.

2. Secondary Financial Impacts to Agencies and Existing Customers

The study area represents approximately two percent of the area currently being served by IRWD. Minimal costs have been incurred to date to support the development proposed for the study area. Therefore, it appears that the financial impacts to the existing IRWD customers would be insignificant under any of the three alternatives studied.

The study area would represent a significant portion of SCWD's service area. The area would represent more than 75 percent of their projected 2010 water demands. If the study area were to be served by SCWD, it appears that economies of scale would be realized by the district. The maintenance and operations costs per service connection may be reduced for existing customers by

10 to 15 percent as described above in subsection 3 - Water, Operational and Maintenance Costs.

3. Transfer of Assets, Properties, Debt

A Memorandum of Understanding (MOU) dated February 4, 1998 exists between SCWD, the Municipal Water District of Orange County, and The Irvine Company that includes terms relating to the use of various proceeds and their application towards the East Orange Lake Village costs, as well as other provisions. Under any alternative affecting the East Orange Lake Village development, the terms of this MOU should be reviewed to assure that obligations are transferred appropriately to avoid potential adverse impacts.

2.4 Conclusions

2.4.1 Reliability of Services

- As a larger district, IRWD has a much larger and diverse portfolio of water supplies. Therefore, Alternative 3 would provide the future residents with a more reliable water supply.

2.4.2 Total Cost to Future Residents

- Based on the engineers' estimates of probable capital construction costs, Alternative 3 is the preferred service provider option. The initial capital costs are approximately 19 percent lower than the other two alternatives.

- The on-going water costs, operations and maintenance costs are estimated to be the least for Alternative 3. Based on on-going costs, Alternative 3 is also the preferred service provider option. The on-going costs would be approximately 26 percent lower than the other options.

- Based on the estimated debt service and operating costs, each future residence would save on average approximately $165 per year if Alternative 3 were implemented, for a savings for the entire study area of $365,000 per year.

- Based on the initial capital costs and the study's funding assumption, the landowner would save more than $3.4 million in connection fees if Alternative 3 were implemented.

- SCWD would need to acquire a site for a well, including drilling and equipping it for Alternatives 1 and 2. During our study, we were not informed of any studies that had been performed to date to find a site for this well. The long-term production rate of the proposed well is also unknown. In addition, the possible

effects on the City of Orange's wells are not known. The proposed location may cause interference with their existing groundwater production. Therefore, the total cost of this water supply is uncertain and could be significantly higher than the costs estimated in the tables. The cost cannot be known until the site selection and testing of the aquifer is completed.

2.4.3 Impacts to Existing Water Systems and Districts

- Based on the data provided to TKC fom the potential service providers, we conclude that significant costs have not been incurred by either district in anticipation of the proposed development within the study area. Therefore, the bifurcation costs appear to be minimal.

- The study area would approximately triple the customer base of SCWD. It would only add 2 percent to the customer base of IRWD. Since SCWD is currently a small district, economies of scale would probably be realized if SCWD were to serve the study area. According to our research, these savings may be as much as 10 to 15 percent.

- The City of Orange is committed to having one water service provider for the Study Area. Since Alternative 3 is the only alternative with one service provider for the entire Study Area, Orange would prefer Alternative 3 from a governance perspective.

- The City of Orange is not in favor of having new water supply wells for the Study Area drilled within their existing service area. Therefore, Orange would prefer Alternative 3 from an existing water supply perspective.

A summary of the findings and conclusions is shown as Table 2-10.

ALTERNATIVES

TABLE 2-10
SUMMARY OF CONCLUSIONS REGARDING THE WATER SYSTEM ALTERNATIVES

		COST			EFFICIENCY & RELIABILITY				IMPACTS	
		Capital Costs	**Annual Operational & Maintenance Costs**	**Cost to Each Residence** [a]	**Reliability**	**Staffing**	**Customer Service**	**Water Quality/ Environ Compliance**	**System Bifurcation**	**Secondary Financial Impacts**
1	Existing Boundaries	$35,301,280	$ 591,290	$15,866/DU (cap) $266/yr (ops)	X	X	X	X	None	None
2	IRWD & SCWD	$35,221,580	$560,550	$15,830/DU (cap) $252/yr (ops)	X	X	X	X	None	None
3	All IRWD	$28,464,975	$436,500	$12,793/DU (cap) $196/yr (ops)	X	X	X	X	Minor	Minor

a. Total capital cost per unit before financing, residential development only. Operations costs assume additional SCWD efficiencies.

Chapter 3
Study of Wastewater Collection Options

3.1 Overview of Alternatives

The alternatives to analyze for the wastewater collection system are the same as the water distribution system. The first alternative is to maintain the current district boundaries. For this alternative, SCWD would provide service to Sub-Areas 2 and 3. IRWD would provide service to Sub-Area 1. Alternative 2 would assume that SCWD would serve East Orange Lake Village, Sub-Area 3. IRWD would serve all of East Orange Area I, Sub-Areas 1 and 2. Alternative 3 would assume that IRWD would serve all of East Orange Area I and East Orange Lake Village, Sub-Areas 1, 2 and 3.

Table 3-1 summarizes the service provider options that were analyzed:

Table 3-1 Wastewater Provider Alternatives

Alternative	Description	Provider	Sub-Area
1	Existing Boundaries	SCWD	2, 3
		IRWD	1
2	SCWD – Lake Village &	SCWD	3
	IRWD - East Orange Area I	IRWD	1,2
3	IRWD – East Orange Area I &	SCWD	-
	East Orange Lake Village	IRWD	1, 2, 3

3.2 Evaluation Criteria for Study

The evaluation criteria for the wastewater collection system were similar to criteria used to evaluate the water distribution system. The criteria for the wastewater analysis are as follows:

3.2.1 Reliability of Services

The wastewater collection systems for all three alternatives propose for the wastewater to be conveyed to the Orange County Sanitation District's (OCSD's) regional wastewater reclamation plant in Fountain Valley or IRWD's Michelson Wastewater Reclamation Plant in Irvine. All systems that were evaluated would collect the wastewater from the proposed development and convey it to an existing trunk sewer. Therefore, the reliability of service to be evaluated includes the ability of the service provider to collect and transport the wastewater to the OCSD trunk sewer without spillage or long detention times.

3.2.2 Total Cost to the Future Residents

1. Capital Costs

The wastewater capital costs evaluation criteria will be similar to the water capital costs. The collection system will require gravity sewer pipelines, sewage lift stations and force mains.

2. Financing/Debt Service Cost

The capital costs expended to construct the major wastewater collection facilities can be funded with various methods. Some entities issue municipal bonds to fund all of the capital facility costs. Other entities require the land developer to pay for some or all of these facility's costs. When this situation occurs, many of the developers work with a local government entity to establish a type of public financing mechanism, such as an assessment district or a community facilities district. With the land value as collateral, the bond payments are made from the proceeds collected from the individual property owners. The property owners can make payments through their semi-annual property tax bill or through their monthly sewage bill. Since the potential service providers have not supplied their proposed percentage of the capital costs that will be financed and the loan term, we have assumed that one half of the initial capital costs will be financed over a period of 20 years. Therefore, the costs to issue debt and the interest rate available to each agency are important components of the total cost to the future residents. In addition to the principal balance to be borrowed, this study addressed the interest rate that each potential service provider would have to pay to finance the debt. Actual financing and interest costs will vary depending on the specific timing and amount of connection fees paid by home builders, and may be greater than shown to the extent that property-secured debt is required in advance of payment of connection fees.

3. Operational, Maintenance and Treatment Costs

The operational and maintenance costs associated with the wastewater collection system are similar to the water operational and maintenance costs. These costs will include electrical costs to pump sewage uphill, the repair and maintenance of the wastewater collection system, and the treatment costs.

3.2.3 Impacts to Existing Wastewater Systems and Districts

1. Bifurcation of District Service Area

For Alternative 1, neither of the existing district's boundaries would be modified. However, Alternative 2 and Alternative 3 propose that a portion of SCWD's district would be annexed into IRWD. If either of these alternatives were

implemented, SCWD's service area would be bifurcated. This study reviewed any financial impacts that may occur if SCWD were to lose a portion of its existing district territory. It may be possible that their financial viability would be threatened if a significant portion of their district were to be removed from their jurisdiction.

2. Secondary Financial Impacts to Agencies and Existing Customers

As stated above, the primary criterion used to evaluate the potential service provider options is the long-term lowest cost to the future residents of the study area, with the same level of service or better. However, this study also reviewed any financial impacts to the existing customers of SCWD and IRWD under the three service provider scenarios.

3. Transfer of Assets, Properties, Debt

One agency may own a parcel of property or wastewater collection facility that would not be needed if the other agency were to be the selected service provider. That asset may be of benefit to the other agency. However, it may also be the case that the asset does not have much value, but it would be equitable to attach the asset and its historical cost to the parcel of land being transferred.

3.3. Analysis of Alternatives

Both potential wastewater collection service providers assumed the same land use plan as shown in Table 2-1. They also used the same daily wastewater generation factors for each type of land use. These average daily wastewater generation factors are consistent with industry practice.

Multiplying the land uses by the wastewater generation factors, both agencies' reports estimated the same average daily wastewater generation from the study area. In Southern California, it is common practice to utilize OCSD's peaking equation for wastewater flows. The equation is $Q_{peak} = 1.84 * Q_{average}^{0.92}$ Based on these wastewater generation factors and the peaking equation, Table 3-2 shows the estimated average daily and peak hour wastewater generated by Sub-Area.

Table 3-2 Estimated Wastewater Generation by Sub-Area		
Land Use	**Average Flow Rate (Gallons/Day)**	**Peak Hour Flow Rate (Gallons/Day)**
Sub-Area 1		
Residential – Low Density	105,000	
Residential – Medium Low Density	90,000	
Institutional	2,448	
Sub-Area 1 Subtotals	**197,448**	**399,457**
Sub-Area 2		
Residential – Low Medium Density	78,750	
Sub-Area 2 Subtotals	**78,750**	**171,476**
Sub-Area 3		
Residential – Low Density	270,000	
Residential – Low- Medium Density	78,750	
Commercial Recreational [a]	29,695	
Institutional	1,748	
Sub-Area 3 Subtotals	**380,193**	**729,890**
Study Area Totals	**656,391**	**1,206,266**

a. Commercial Recreational includes a 100-room hotel.

3.3.1 Proposed Wastewater Collection Systems

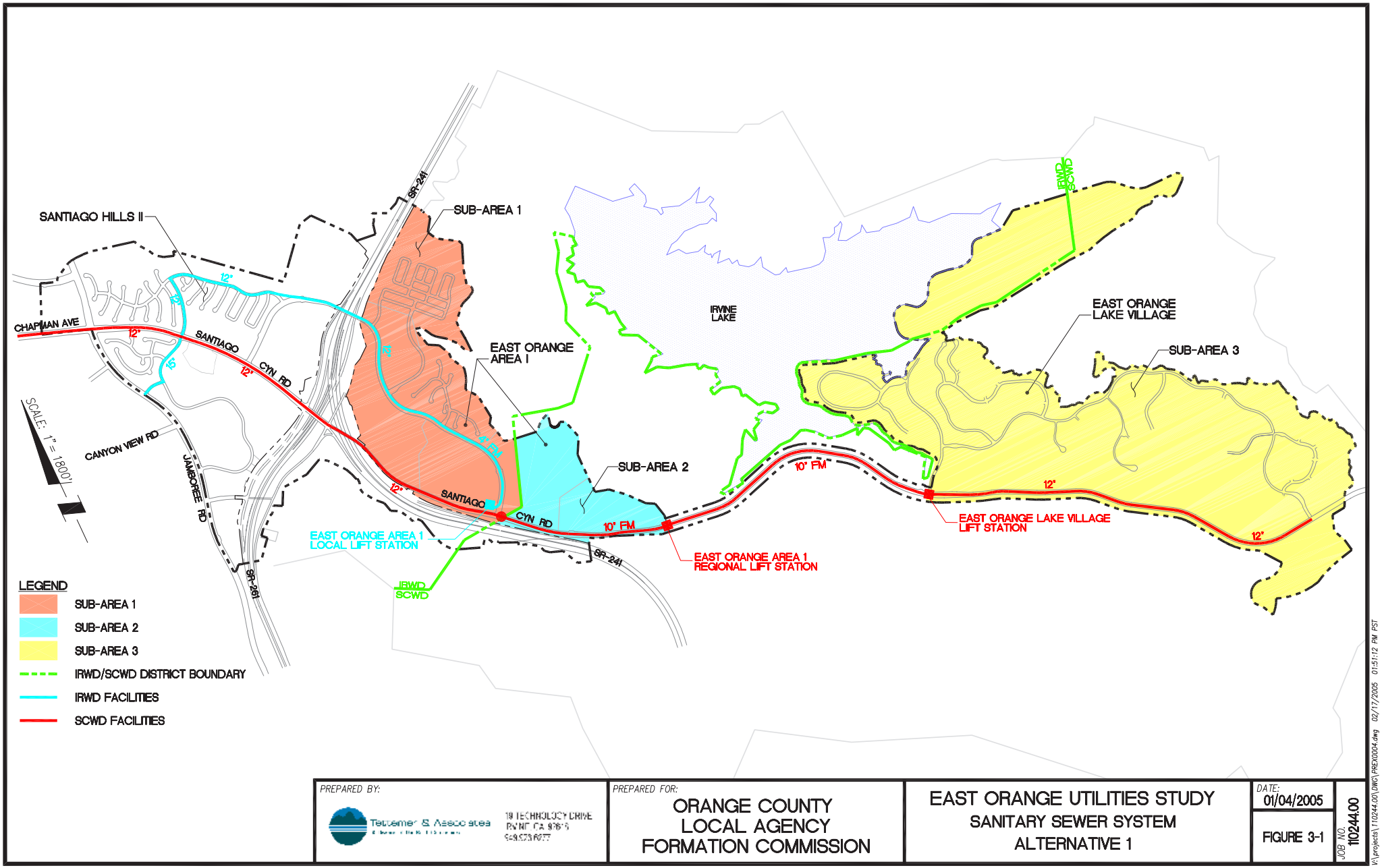
Based on the estimated wastewater generation, the wastewater collection systems proposed in the SCWD Master Plan and the IRWD SAMP were analyzed. Since SCWD's Master Plan assumed that only Sub-Area 3 would be served by SCWD, TKC added (or increased) the capacity and extent of the proposed facilities as appropriate for Alternative 1. Since IRWD's SAMP assumed that IRWD would be the service provider for the entire study area, TKC deleted (or decreased) the capacity and extents of the proposed collection facilities as appropriate for Alternatives 1 and 2.

1. Alternative 1 - Existing Boundaries

This study's wastewater collection system for Alternative 1 is shown in Figure 3-1 and described below.

a. Proposed SCWD Wastewater Collection Facilities

SCWD would provide wastewater collection service to Sub-Areas 2 and 3. The proposed system would include gravity sewers throughout Sub-Areas 2 and 3. A sewage lift station would be located along Santiago Canyon Road, near the



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FORMATION COMMISSION

EAST ORANGE UTILITIES STUDY

SANITARY SEWER SYSTEM
ALTERNATIVE 1

DATE: 01/04/2005

FIGURE 3-1

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western boundary of Sub-Area 3. A sewer force main would pump the wastewater to a second lift station also along Santiago Canyon Road. This second station would be near the eastern boundary of Sub-Area 2. The sewer force main from this lift station would be routed along Santiago Canyon Road to the current SCWD/IRWD district boundary. A gravity sewer would then be routed along Santiago Canyon Road, crossing SR-241 and SR-261, to the proposed point of connection to the OCSD's Sunflower trunk sewer. The wastewater generated by Sub-Area 2 would flow by gravity into the second lift station discussed above.

b. Proposed IRWD Wastewater Collection Facilities

IRWD would provide wastewater collection service to Sub-Area 1. The majority of the wastewater generated by Sub-Area 1 would flow by gravity across SR-241 and through the proposed Santiago Hills II development's gravity sewer to the existing IRWD Harvard Avenue Trunk Sewer (HATS). A small sewage lift station would be required to the pump wastewater from a small portion of Sub-Area 1. The lift station's force main would be routed to the gravity sewer within Sub-Area 1.

2. Alternative 2 - SCWD - East Orange Lake Village, IRWD - East Orange Area I

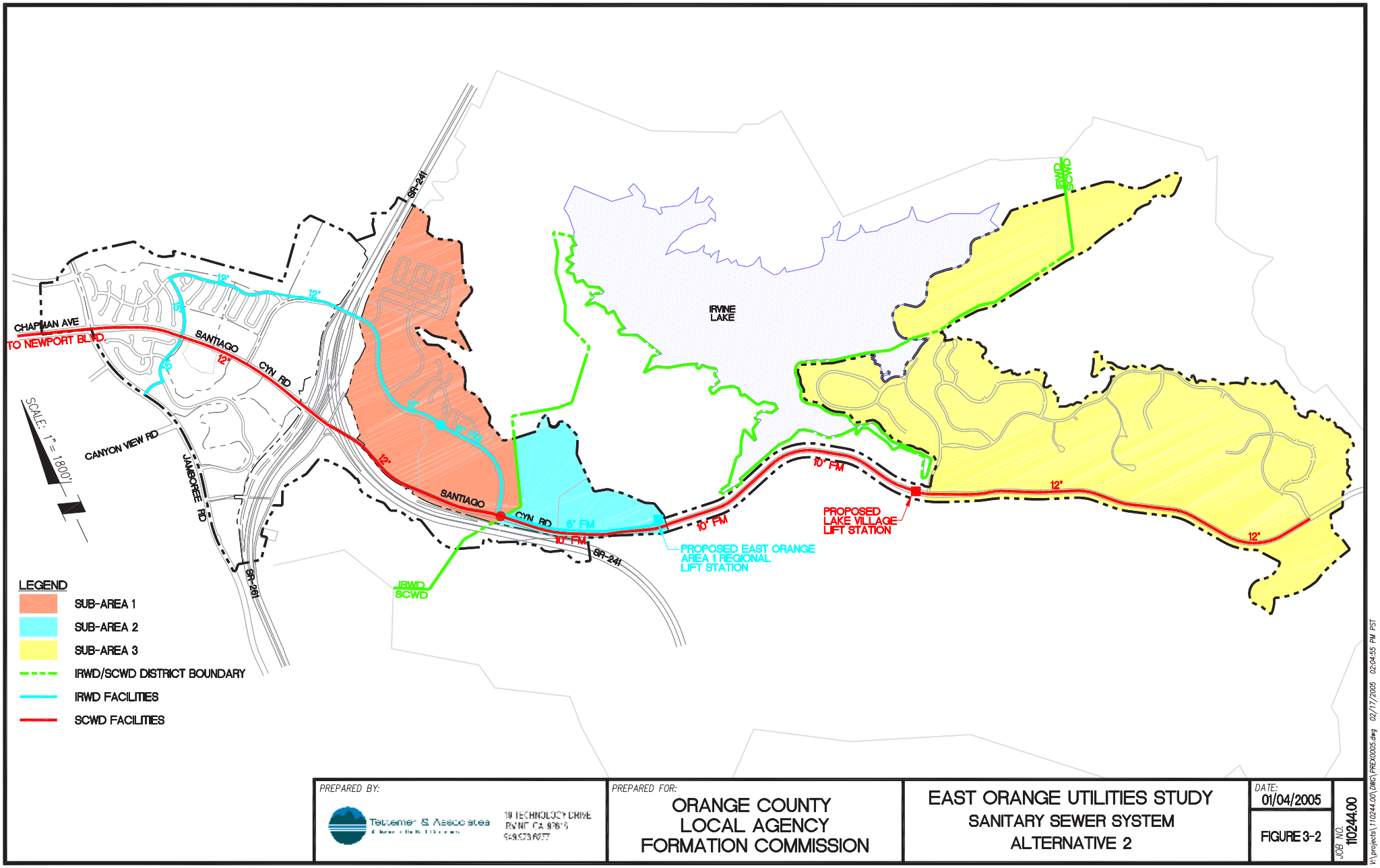
This study's wastewater collection system for Alternative 2 is shown in Figure 3-2 and described below.

a. Proposed SCWD Wastewater Collection Facilities

SCWD would provide wastewater collection service to Sub-Area 3. The proposed system would include gravity sewers throughout Sub-Area 3. A sewage lift station would be located along Santiago Canyon Road, near the western boundary of Sub-Area 3. A sewer force main would pump the wastewater from this lift station along Santiago Canyon Road to the current SCWD/IRWD district boundary. A gravity sewer would then be routed along Santiago Canyon Road, crossing SR-241 and SR-261, to the proposed point of connection to the OCSD's Sunflower trunk sewer.

b. Proposed IRWD Wastewater Collection Facilities

IRWD would provide wastewater collection service to Sub-Areas 1 and 2. The majority of the wastewater generated by Sub-Area 1 would flow by gravity across SR-241 and through the proposed Santiago Hills II development's gravity sewer to the existing IRWD HATS collection system. The wastewater generated by Sub-Area 2 and a small percentage of the wastewater generated by Sub-Area 1 would flow south by gravity to a proposed lift station along Santiago Canyon Road, near the eastern boundary of Sub-Area 2. The force main from this lift station would be routed north to join the proposed gravity sewer proposed for Sub-Area 1.



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EAST ORANGE UTILITIES STUDY
SANITARY SEWER SYSTEM
ALTERNATIVE 2

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FIGURE 3-2

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3. Alternative 3 - IRWD - Entire Study Area

This study's wastewater collection system for Alternative 3 is shown in Figure 3-3 and described below.

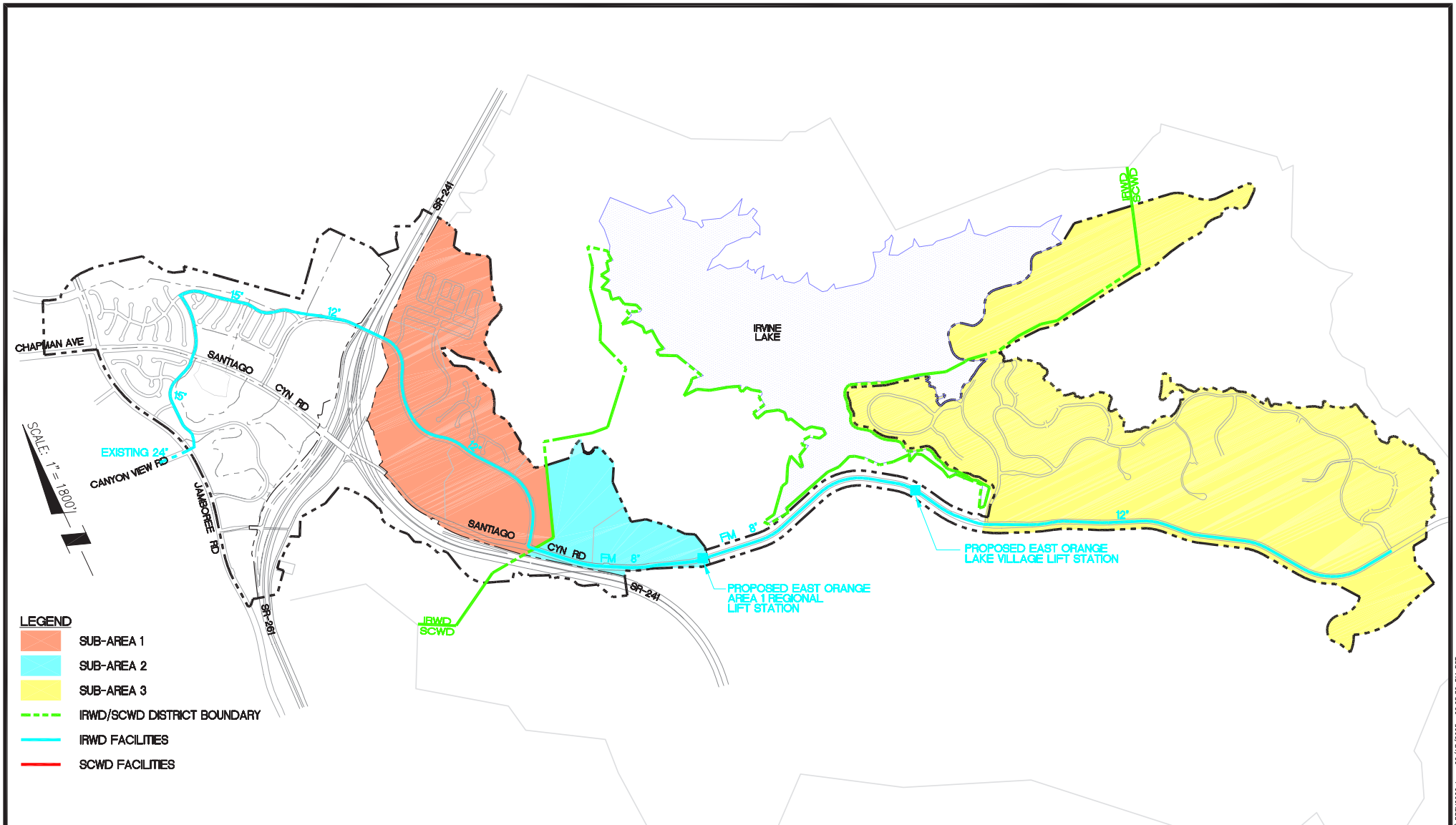
IRWD would provide wastewater collection service to Sub-Areas 1, 2 and 3. The proposed system would include gravity sewers throughout Sub-Areas 1, 2 and 3. A sewage lift station would be located along Santiago Canyon Road, near the western boundary of Sub-Area 3. A sewer force main would pump the wastewater from this lift station along Santiago Canyon Road to a second lift station along Santiago Canyon Road, near the eastern boundary of Sub-Area 2. The force main from this second lift station would be routed north to join the proposed gravity sewer routed through Sub-Area 1. This gravity sewer would be routed across SR-241 and through the proposed Santiago Hills II development's gravity sewer to the existing IRWD HATS collection system. The wastewater generated by a small portion of Sub-Area 1 and all from Sub-Area 2 would flow south by gravity to the proposed lift station near Sub-Area 2. The majority of Sub-Area 1 would flow by gravity into the proposed sewer described above.

3.3.2 Reliability of Services

Under all three alternatives, the wastewater could be processed by the OCSD. For all three alternatives, the IRWD portion of the wastewater could also be processed at their Michelson Wastewater Reclamation Plant. Both OCSD and IRWD have been providing reliable wastewater treatment at their treatment plants for decades. Therefore, the treatment and disposal of the wastewater system is considered reliable.

IRWD has been providing reliable wastewater collection since their inception. Their proposed system for the study area is comparable to their existing system. It is a conventional gravity wastewater collection system with lift stations proposed to pump the wastewater uphill. The lift stations would have redundant pumps. Each station would have an emergency power generator or a receptacle for a portable generator. Therefore, TKC concludes that the proposed wastewater collection system proposed by IRWD would be reliable.

SCWD does not currently provide wastewater collection services. Therefore, they do not have a track record to demonstrate a history of providing a reliable system. However, the wastewater collection system proposed by SCWD is consistent with industry standard, and there is no reason to conclude that SCWD would not provide reliable service. The operating costs assumed in this study would provide adequate financial resources to provide the necessary services to the future residents of the study area.



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SANITARY SEWER SYSTEM
ALTERNATIVE 3

DATE: 01/04/2005

FIGURE 3-3

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3.3.3 Total Costs to Future Residents

1. Capital Costs

The reference reports provide each agency's representation of the major wastewater collection facilities that will be required to properly serve the study area. Neither report comprehensively describes the small diameter collection pipes, as their locations and lengths cannot be known until the final engineering and street improvement plans are prepared. Since these small diameter pipelines cannot be determined and will be funded directly by the land developer, they have been excluded from this analysis.

IRWD has wastewater collection facilities in close proximity to the study area. However, it does not have on-site facilities in place to serve the proposed development. SCWD does not currently own any wastewater collection facilities. Therefore, each prospective service provider would be required to construct new facilities and/or upgrade existing facilities to meet the operational needs of the study area.

The construction costs per linear foot of sewer pipeline were computed based on the unit costs shown in Table 3-3. As shown in footnote a), the unit cost per foot for pipe sizes 6-inches through 10-inches are for normal depth sewage force mains. The unit costs for pipelines with diameters of 12-inches or larger are for normal depth gravity sewers. As shown in footnote b), the unit cost per foot was increased for deep pipeline construction.

Table 3-3 Sewer Unit Costs [a, b]

Diameter, inches	Construction Cost, $/LF
6	40
8	50
10	65
12	100
15	210
18	260

a) The costs for the 6-inch diameter through 10-inch diameter pipe sizes are for normal depth force mains. For pipes with diameters greater than 10-inches, the costs are for normal depth gravity sewers.
b) $90/LF was added to the unit cost for deep pipeline construction.

The construction costs do not include the costs to acquire land or easements. Normally ICDC transfers the required property to the wastewater agency without charge. In return, the agency attempts to make the facility as aesthetically pleasing as possible. Also, the property that is used for lift station sites is

typically difficult to develop. Therefore, the land value is not as high as the developable area.

Based on our analysis, TKC estimated opinions of probable capital construction costs for the three alternatives. The detailed computations are provided in Appendix B. The costs are summarized as follows:

Table 3-4 Estimated Total Capital Wastewater Costs, dollars

Service Provider	Alternative 1	Alternative 2	Alternative 3
SCWD	$9,511,243.	$8,498,743.	$ 0
IRWD	$1,792,800.	$ 2,479,300.	$ 10,085,993.
TOTAL	**$11,304,043.**	**$10,978,043.**	**$ 10,085,993.**

Table 3-5 Estimated Capital Wastewater Costs per Dwelling Unit, dollars

Service Provider	Alternative 1	Alternative 2	Alternative 3
SCWD	$6,097.	$6,799.	$ 0
IRWD	$2,696.	$2,543.	$ 4,533.
TOTAL	**$ 5,080.**	**$ 4,934.**	**$ 4,533.**

As discussed earlier in this report, the wastewater for all alternatives would be conveyed to the west from East Orange Lake Village to East Orange Area I, across State Route 241 and through the proposed Santiago Hills II development. Therefore, the proposed on-site facilities costs would be similar.

All of the estimated capital costs are of similar magnitudes. This is reasonable as neither agency currently has facilities in the study area. For all alternatives, the study area would be required to be annexed into the Orange County Sanitation District. OCSD's fees would be similar regardless of the service provider.

The major difference between the alternatives relates to the off-site facilities required. SCWD's Master Plan proposes that the gravity sewer be routed from their district boundary to the OCSD's existing Sunflower Trunk Sewer. Since this would be the only area within SCWD's district that would be served by a conventional sewage collection system, all costs related to the off-site sewer would be allocated to the study area. Since all alternatives include IRWD serving the portion of East Orange Area I that is within their current boundaries and the Santiago Hills II development outside of the study area, the off-site gravity sewer would be shared by all of these proposed developments. Therefore, only a portion of the costs for the off-site gravity sewer would be allocated to the study area.

Also, IRWD's proposed point of connection to the existing system is closer to the study area than SCWD's connection point.

2. Financing/Debt Service Cost

As described in Chapter 2, our study assumes that the capital costs would be financed through a combination of connection charges and general obligation debt funded by property taxes on new development. The financing allows for a distribution of costs between the developer and the homeowner. For this analysis, we have assumed that one half of the capital costs will be funded through connection fees and one half will be funded through the issuance of debt.

The finance charges increase the cost differences between the alternatives. For example, the average per unit costs for Alternatives 1 and 2 are similar, and the corresponding annual debt service payment per unit is similar at about $155 per unit per year, averaged over both districts. The capital costs for Alternative 3 are about 7 percent lower than the other alternatives, and the corresponding annual debt service payment is about $140 per unit per year, with lower capital and interest components.

3. Operational, Maintenance and Treatment Costs

Due to the relatively small scale of the study area compared to the IRWD's total service area, it is unlikely that the additional service would significantly affect the District's average operating costs and rate structure. It is IRWD's policy to charge all of their customers the same wastewater rates, regardless of the distance from the wastewater treatment plant. Based on IRWD's current rates, the average charge per residential unit would be $8.35 per month, or approximately $100 per dwelling unit per year. Actual costs will depend upon the specific operational characteristics of the new systems, which have not been estimated as a part of this analysis. However, the lower-cost system associated with Alternative 3 generally should incur lower maintenance and replacement costs, as well as lower costs related to other aspects of operation.

Because SCWD does not currently provide wastewater service, there is no information upon which to base estimates of service charges. For purposes of comparison, rates were assumed to be based on treatment charges by OCSD currently paid by IRWD ($749 per million gallons, per IRWD's 2003 audited financial statements), plus an administrative component assumed to be an additional 28 percent (based on IRWD costs). The resulting charge is $10.80 per household per month. Actual charges are likely to be higher to account for pumping operations, maintenance and depreciation; a Statewide survey of wastewater charges indicated that average charges for districts serving 10,000 or fewer residents averages $28 per month. The smallest Orange County entity in the survey was the El Toro Water District, which operates its own treatment plant and charges $16.60 per average dwelling unit.

3.3.4 Impacts to Existing Wastewater Systems and Districts

1. Bifurcation of District Service Area

SCWD does not currently operate a wastewater collection system. All of their current customers are on individual septic tank systems. Therefore, bifurcation of the wastewater collection system should not be an issue to SCWD.

None of the proposed alternatives assume that IRWD would relinquish any proposed service area to SCWD. Therefore, bifurcation of the wastewater collection system should not be an issue to IRWD.

2. Secondary Financial Impacts to Agencies and Existing Customers

According to SCWD Master Plan, the Study Area is the only portion of SCWD that would ever be served by a conventional wastewater collection system. The remainder of the district is planned to be on individual septic tank systems. Therefore, it does not appear that any of the alternatives would have any secondary impact to the agency or their existing customers.

The study area would represent approximately two percent of the service area of IRWD. The only gravity sewer pipeline that would be upsized to accommodate the study area has not been constructed. If IRWD were not the service provider for Sub-Areas 2 and/or 3, the proposed gravity sewer sizes would be reduced. Therefore, any secondary impacts to the agency or existing customers would be negligible.

3. Transfer of Assets, Properties, Debt

SCWD currently does not own any wastewater facilities. IRWD has not built any facilities specifically to accommodate the flows generated by the study area. Therefore, no transfers of assets, property or debt should be required with any of the alternatives being implemented.

3.4 Conclusions

3.4.1 Reliability of Services

- All three alternatives would provide adequate and equally reliable wastewater collection and treatment systems based on the criteria established in this study.

3.4.2 Total Cost to Future Residents

- Based on the estimated debt service and operating costs, each future residence would save on average approximately $40 per year if Alternative 3 were implemented, for a savings for the entire study area of $90,000.

- Based on the initial capital costs and the study's funding assumption, the landowner would save approximately $600,000 in connection fees if Alternative 3 were implemented.

- Based on our research, SCWD has not investigated the ability of OCSD's Sunflower trunk sewer to convey the wastewater generated by the study area. According to representatives at OCSD, the Sunflower trunk sewer was not designed to accommodate the flows generated by the study area. OCSD has not investigated the remaining capacity within their trunk sewer. Therefore, it cannot be assumed that adequate capacity exists within this pipeline. The Sunflower trunk sewer may require upsizing in certain reaches that are not known at this time. This may add to the capital costs for Alternatives 1 and 2.

- SCWD currently does not provide wastewater collection service. All residents within their service area are currently on septic tanks. Therefore, SCWD would be operating in a new service for them. There is uncertainty regarding the cost to service and maintain the wastewater system.

3.4.3 Impacts to Existing Wastewater Systems and Districts

- Since neither potential wastewater collection service provider has any wastewater facilities in proximity to the study area. The study area would only add approximately 2 percent to IRWD's service area. SCWD currently does not provide wastewater collection. Therefore, the impacts from bifurcation, or any secondary impacts appear to be minor.

A summary of the findings and conclusions is shown as Table 3-6.

ALTERNATIVES

TABLE 3-6
SUMMARY OF CONCLUSIONS REGARDING WASTEWATER SYSTEM ALTERNATIVES

		COST			EFFICIENCY & RELIABILITY			IMPACT	
		Capital Costs	**Annual Operational Costs**	**Cost to Each Residence** [a]	**Reliability**	**Staffing**	**Customer Service**	**System Bifurcation**	**Secondary Financial**
1	Existing Boundaries	$ 11,304,043	$ 268,810	$5,080/DU (cap) $121/yr (ops)	X	X	X	None	None
2	IRWD East Orange & SCWD Lake Village	$ 10,978,043	$259,695	$4,934/DU (cap) $117/yr (ops)	X	X	X	None	None
3	IRWD East Orange & Lake Village	$ 10,085,993	$222,950	$4,533/DU (cap) $100/yr (ops)	X	X	X	None	None

a. Total capital cost per unit before financing, residential development only.

Appendix A

LAFCO's Mandated Factors/Criteria (Govt Code §56668)

56668. Factors to be considered in the review of a proposal shall include, but not be limited to, all of the following:

(a) Population and population density; land area and land use; per capita assessed valuation; topography, natural boundaries, and drainage basins; proximity to other populated areas; the likelihood of significant growth in the area, and in adjacent incorporated and unincorporated areas, during the next 10 years.

(b) Need for organized community services; the present cost and adequacy of governmental services and controls in the area; probable future needs for those services and controls; probable effect of the proposed incorporation, formation, annexation, or exclusion and of alternative courses of action on the cost and adequacy of services and controls in the area and adjacent areas.

"Services" as used in this subdivision, refers to governmental services whether or not the services are services which would be provided by local agencies subject to this division, and includes the public facilities necessary to provide those services.

(c) The effect of the proposed action and of alternative actions, on adjacent areas, on mutual social and economic interests, and on the local governmental structure of the county.

(d) The conformity of both the proposal and its anticipated effects with both the adopted commission policies on providing planned, orderly, efficient patterns of urban development, and the policies and priorities set forth in Section 56377.

(e) The effect of the proposal on maintaining the physical and economic integrity of agricultural lands, as defined by Section 56016.

(f) The definiteness and certainty of the boundaries of the territory, the nonconformance of proposed boundaries with lines of assessment or ownership, the creation of islands or corridors of unincorporated territory, and other similar matters affecting the proposed boundaries.

(g) Consistency with city or county general and specific plans.

(h) The sphere of influence of any local agency which may be applicable to the proposal being reviewed.

(i) The comments of any affected local agency.

(j) The ability of the newly formed or receiving entity to provide the services which are the subject of the application to the area, including the sufficiency of revenues for those services following the proposed boundary change.

(k) Timely availability of water supplies adequate for projected needs as specified in Section 65352.5.

(l) The extent to which the proposal will affect a city or cities and the county in achieving their respective fair shares of the regional housing needs as determined by the appropriate council of governments consistent with Article 10.6 (commencing with Section 65580) of Chapter 3 of Division 1 of Title 7.

(m) Any information or comments from the landowner or owners.

(n) Any information relating to existing land use designations.

Appendix B

Supporting Engineering Calculations

Orange County Local Agency Formation Commission

East Orange Utilities Study

Water Booster Pump Stations Analysis

SCWD Booster Pump Stations:

Santiago Hills Booster Pump Station Upgrade

Duty Pumps		
Q=	3,700	GPM
TDH =	500	Feet
efficiency =	70%	
Power =	667	Hp
Redundant Pump	222	Hp
Total Station	890	Hp
Total Station	1,000	Hp
Fire Flow Pump		
Q=	3,500	GPM
TDH =	434	Feet
efficiency =	70%	
Power =	548	Hp
Cost per Hp	$ 1,800	
Credit for current sta	$ 1,000,000	
Total Cost =	**$ 800,000**	

Lake Village Booster Pump Station

Duty Pumps		
Q=	1,300	GPM
TDH =	300	Feet
efficiency =	70%	
Power =	141	Hp
Redundant Pump	70	Hp
Total Station	211	Hp
Total Station	250	Hp
Fire Flow Pump		
Q=	1,500	GPM
TDH =	250	Feet
efficiency =	70%	
Power =	135	Hp
Cost per Hp	$ 5,400	
Total Cost =	**$ 1,350,000**	

IRWD Booster Pump Stations:

Zone 5-7 Booster Pump Station

Duty Pumps		
Q=	5,518	GPM
TDH =	470	Feet
efficiency =	70%	
Power =	936	Hp
Redundant Pump	234	Hp
Total Station	1,170	Hp
Total Station	1,250	Hp
Fire Flow Pump		
Q=	3,500	GPM
TDH =	434	Feet
efficiency =	70%	
Power =	548	Hp
Cost per Hp	$ 1,550	
Total Cost =	**$ 1,938,000**	

Zone 7-8 Booster Pump Station

Duty Pumps		
Q=	3,578	GPM
TDH =	113	Feet
efficiency =	70%	
Power =	146	Hp
Nameplate	150	Hp
Redundant Pump	73	Hp
Total Station	225	Hp
Fire Flow		
Q=	3,500	GPM
TDH =	77	Feet
efficiency =	70%	
Power =	97	Hp
Nameplate	100	Hp
Cost per Hp	$ 5,950	
Total Cost =	**$ 1,339,000**	

Orange County Local Agency Formation Commission
East Orange Utilities Study
Water Distribution System Capital Costs Comparison

Item	Alternative I							Alternative II							Alternative III						
	IRWD	SCWD	Total	Unit Cost	IRWD Cost	SCWD Cost	Total Cost	IRWD	SCWD	Total	Unit Cost	IRWD Cost	SCWD Cost	Total Cost	IRWD	SCWD	Total	Unit Cost	IRWD Cost	SCWD Cost	Total Cost
24-inch Pipe [a]		18,000	18,000	$ 125	$ -	$ 2,250,000	$ 2,250,000		18,000	18,000	$ 125	$ -	$ 2,250,000	$ 2,250,000			-	$ 125	$ -	$ -	$ -
20-inch Pipe		1,500	1,500	$ 125	$ -	$ 187,500	$ 187,500		1,500	1,500	$ 125	$ -	$ 187,500	$ 187,500			-	$ 125	$ -	$ -	$ -
16-inch Pipe (On-site) [b]	11,411	17,937	29,348	$ 100	$ 1,141,100	$ 1,614,330	$ 2,755,430	11,411	17,937	29,348	$ 100	$ 1,141,100	$ 1,614,330	$ 2,755,430	37,481		37,481	$ 100	$ 3,748,100	$ -	$ 3,748,100
16-inch Pipe (Off-site)		15,000	15,000	$ 120	$ -	$ 1,800,000	$ 1,800,000		15,000	15,000	$ 120	$ -	$ 1,800,000	$ 1,800,000			-	$ 120	$ -	$ -	$ -
12-inch Pipe	1,630	17,700	19,330	$ 75	$ 122,250	$ 1,327,500	$ 1,449,750	1,630	17,700	19,330	$ 75	$ 122,250	$ 1,327,500	$ 1,449,750	26,495		26,495	$ 75	$ 1,987,125	$ -	$ 1,987,125
10-inch Pipe			-	$ 65	$ -	$ -	$ -			-	$ 65	$ -	$ -	$ -	5,170		5,170	$ 65	$ 336,050	$ -	$ 336,050
8-inch Pipe	7,100		7,100	$ 50	$ 355,000	$ -	$ 355,000	7,100		7,100	$ 50	$ 355,000	$ -	$ 355,000	34,650		34,650	$ 50	$ 1,732,500	$ -	$ 1,732,500
6-inch Pipe	5,960		5,960	$ 40	$ 238,400	$ -	$ 238,400	10,735		10,735	$ 40	$ 429,400	$ -	$ 429,400	10,735		10,735	$ 40	$ 429,400	$ -	$ 429,400
SCWD Intertie	1		1	$ 200,000	$ 200,000	$ -	$ 200,000	1		1	$ 200,000	$ 200,000	$ -	$ 200,000	1		1	$ 200,000	$ 200,000	$ -	$ 200,000
Santiago Hills BPS		1	1	$ 800,000	$ -	$ 800,000	$ 800,000		1	1	$ 800,000	$ -	$ 800,000	$ 800,000			-	$ 800,000	$ -	$ -	$ -
Zone 5-7 BPS	1		1	$ 1,938,000	$ 1,938,000	$ -	$ 1,938,000	1		1	$ 1,938,000	$ 1,938,000	$ -	$ 1,938,000	1		1	$ 1,938,000	$ 1,938,000	$ -	$ 1,938,000
Well Construction		1	1	$ 1,000,000	$ -	$ 1,000,000	$ 1,000,000		1	1	$ 1,000,000	$ -	$ 1,000,000	$ 1,000,000			-	$ 1,000,000	$ -	$ -	$ -
Reservoir Storage	2,800,000	6,440,000	9,240,000	$ 1.25	$ 3,500,000	$ 8,050,000	$ 11,550,000	3,100,000	5,940,000	9,040,000	$ 1.25	$ 3,875,000	$ 7,425,000	$ 11,300,000	7,000,000		7,000,000	$ 1.25	$ 8,750,000	$ -	$ 8,750,000
12-inch Backflow Device	2		2	$ 75,000	$ 150,000	$ -	$ 150,000	2		2	$ 75,000	$ 150,000	$ -	$ 150,000	4		4	$ 75,000	$ 300,000	$ -	$ 300,000
10-inch Backflow Device			-	$ 75,000	$ -	$ -	$ -			-	$ 75,000	$ -	$ -	$ -	2		2	$ 75,000	$ 150,000	$ -	$ 150,000
Demolish Fleming Reservoir		1	1	$ 75,000	$ -	$ 75,000	$ 75,000		1	1	$ 75,000	$ -	$ 75,000	$ 75,000			-	$ 75,000	$ -	$ -	$ -
Demolish Fleming Pump Station		1	1	$ 50,000	$ -	$ 50,000	$ 50,000		1	1	$ 50,000	$ -	$ 50,000	$ 50,000			-	$ 50,000	$ -	$ -	$ -
Lake Village BPS		1	1	$ 1,350,000	$ -	$ 1,350,000	$ 1,350,000		1	1	$ 1,350,000	$ -	$ 1,350,000	$ 1,350,000			-	$ 1,350,000	$ -	$ -	$ -
Zone 7-8 BPS		-	-	$ 1,339,000	$ -	$ -	$ -		-	-	$ 1,339,000	$ -	$ -	$ -	1		1	$ 1,339,000	$ 1,339,000	$ -	$ 1,339,000
Pressure Reducing Station (Primary)		-	-	$ 125,000	$ -	$ -	$ -		-	-	$ 125,000	$ -	$ -	$ -	1		1	$ 125,000	$ 125,000	$ -	$ 125,000
Pressure Reducing Station (Secondary)		-	-	$ 50,000	$ -	$ -	$ -		-	-	$ 50,000	$ -	$ -	$ -	1		1	$ 50,000	$ 50,000	$ -	$ 50,000
Subtotals					$ 7,644,750	$ 18,504,330	$ 26,149,080					$ 8,210,750	$ 17,879,330	$ 26,090,080					$ 21,085,175	$ -	$ 21,085,175
Contingency, Engineering & Admin.					2,675,700	6,476,500	9,152,200					2,873,800	6,257,800	9,131,500					7,379,800	-	7,379,800
Grand Total					$ 10,320,450	$ 24,980,830	$ 35,301,280					$ 11,084,550	$ 24,137,130	$ 35,221,580					$ 28,464,975	$ -	$ 28,464,975

a. The SCWD Master Plan allocated the cost for the 24-inch pipe between the study area and the remaining district. The Master Plan allocated the cost of an equivalent 20-inch pipe to the study area and the incremental upsizing to the remaining district.
b. The SCWD Master Plan includes 19,900 LF of 16-inch pipe to serve the study area. After allocations to ID 2 and the remaining area, the equivalent length is 17,937 LF.

Orange County Local Agency Formation Commission

East Orange Utilties Study

Sewer Collection System Cost Comparison

Item	Alternative I							Alternative II							Alternative III						
	IRWD	SCWD	Total	Unit Cost	IRWD Cost	SCWD Cost	Total Cost	IRWD	SCWD	Total	Unit Cost	IRWD Cost	SCWD Cost	Total Cost	IRWD	SCWD	Total	Unit Cost	IRWD Cost	SCWD Cost	Total Cost
15-inch Gravity Sewer Pipe	3,900		3,900	$ 210	$ 819,000	$ -	$ 819,000	3,900		3,900	$ 210	$ 819,000	$ -	$ 819,000	7,820		7,820	$ 210	$ 1,642,200	$ -	$ 1,642,200
12-inch Gravity Sewer Pipe	2,000	21,050	23,050	$ 100	$ 200,000	$2,105,000	$ 2,305,000	2,000	21,050	23,050	$ 100	$ 200,000	$ 2,105,000	$ 2,305,000	9,990		9,990	$ 100	$ 999,000	$ -	$ 999,000
10-inch Force Main		6,350	6,350	$ 65	$ -	$ 412,750	$ 412,750		6,350	6,350	$ 65	$ -	$ 412,750	$ 412,750			-	$ 65	$ -	$ -	$ -
10-inch Force Main- Deep		3,000	3,000	$ 140	$ -	$ 420,000	$ 420,000		3,000	3,000	$ 140	$ -	$ 420,000	$ 420,000			-	$ 140	$ -	$ -	$ -
8-inch Force Main			-	$ 50	$ -	$ -	$ -			-	$ 50	$ -	$ -	$ -	7,500		7,500	$ 50	$ 375,000	$ -	$ 375,000
8-inch Force Main - Deep			-	$ 130	$ -	$ -	$ -			-	$ 130	$ -	$ -	$ -	3,000		3,000	$ 130	$ 390,000	$ -	$ 390,000
6-inch Force Main			-	$ 40	$ -	$ -	$ -	1,500		1,500	$ 40	$ 60,000	$ -	$ 60,000			-	$ 40	$ -	$ -	$ -
4-inch Force Main	2,900		2,900	$ 35	$ 101,500	$ -	$ 101,500			-	$ 35	$ -	$ -	$ -			-	$ 35	$ -	$ -	$ -
East Orange Area I Local Lift Station	1		1	$ 200,000	$ 200,000	$ -	$ 200,000			-	$ 200,000	$ -	$ -	$ -			-	$ 200,000	$ -	$ -	$ -
East Orange Area I Lift Station		1	1	$ 750,000	$ -	$ 750,000	$ 750,000	1		1	$ 750,000	$ 750,000	$ -	$ 750,000	1		1	$ 750,000	$ 750,000	$ -	$ 750,000
Lake Village Lift Station		1	1	$ 700,000	$ -	$ 700,000	$ 700,000		1	1	$ 700,000	$ -	$ 700,000	$ 700,000	1		1	$ 700,000	$ 700,000	$ -	$ 700,000
OCSD Fees		1	1	$3,115,293	$ -	$3,115,293	$ 3,115,293		1	1	$ 3,115,293	$ -	$ 3,115,293	$ 3,115,293	1		1	$ 3,115,293	$ 3,115,293	$ -	$ 3,115,293
SR 261 Crossing		1	1	$ 50,000	$ -	$ 50,000	$ 50,000		1	1	$ 50,000	$ -	$ 50,000	$ 50,000			-	$ 50,000	$ -	$ -	$ -
SR 241 Crossing		1	1	$ 300,000	$ -	$ 300,000	$ 300,000		1	1	$ 300,000	$ -	$ 300,000	$ 300,000	1		1	$ 300,000	$ 300,000	$ -	$ 300,000
Connection to Existing 24-inch Sewer	1		1	$ 7,500	$ 7,500	$ -	$ 7,500	1		1	$ 7,500	$ 7,500	$ -	$ 7,500	1		1	$ 7,500	$ 7,500	$ -	$ 7,500
Subtotals					$1,328,000	$7,853,043	$ 9,181,043					$ 1,836,500	$ 7,103,043	$ 8,939,543					$ 8,278,993	$ -	$ 8,278,993
Contingency, Engineering & Admin.					$ 464,800	$1,658,200	$ 2,123,000					$ 642,800	$ 1,395,700	$ 2,038,500					$ 1,807,000		$ 1,807,000
Grand Totals					$1,792,800	$9,511,243	$11,304,043					$ 2,479,300	$ 8,498,743	$ 10,978,043					$10,085,993		$ 10,085,993
			36,300	LF			$11,304,043			36,300	LF			$ 10,978,043			25,310	LF			

Appendix C

Technical Appendix – Financial Analysis

Technical Appendix
Financial Analysis

Water Delivery
Wastewater Collection

Table 1
Project Description Summary

	Alt. 1		Alt. 2		Alt. 3	
	IRWD Current Boundary	SCWD Current Boundary	IRWD Annexes part of SCWD	SCWD Part of district detached	IRWD Annexes, serves 100%	SCWD No Service to Area
Number of Units						
Residential						
E.Orange Area 1	665	310	975	0	975	0
E.Orange Lake Village	0	1,250	0	1,250	1,250	0
Total	665	1,560	975	1,250	2,225	0
Hotel	0	100	0	100	100	0

Table 2
Basic Assumptions

Item		Amount	Description
Finance Assumptions			
Interest Rate	(1)	3.75%	Avg. variable rate, w/marketing, issuance costs
Term		25	Years
Summary Totals			
Number of Years		25	Corresponds to finance term
Discount Rate		6.0%	
Inflation		3.0%	

(1) Source: IRWD

Summary
Water Delivery Financial Analysis

Table 3
Water Delivery Options
Capital Costs and Financing
Total, Both Districts

	Alternative Alt. 1	Alt. 2	Alt. 3
Number of Units			
Residential	2,225	2,225	2,225
Hotel	100	100	100
Total	2,325	2,325	2,325
Capital Costs			
Total	35,301,280	35,221,680	28,464,975
Cost per Res. Unit	15,866	15,830	12,793
Connection Fees			
Total	17,650,640	17,610,840	14,232,488
Costs net of Fees			
Total	17,650,640	17,610,840	14,232,488
Debt Service (1)			
Annual Total (Residential)	1,100,194	1,097,713	887,135
Annual per Residential Unit	494	493	399
25-Year Total	27,504,855	27,442,835	22,178,375
25-Year Total per Res. Unit	12,362	12,334	9,968

(1) Finance assumptions

interest rate:	3.75%
term:	25

Table 4
Water Delivery Options
Operating Charges
Total, Both Districts

	Alt. 1	Alternative Alt. 2	Alt. 3
Number of Units			
Residential	2,225	2,225	2,225
Hotel	100	100	100
Total	2,325	2,325	2,325
Operating Charges			
Annual Residential Charges (1)	386,802	330,630	104,130
Commodity Charges			
Annual Residential Charges (2)	801,351	708,165	332,415
Total Charges			
Annual Residential Charges	$1,188,153	$1,038,795	$436,545
Annual Charges per Res. Unit	$534	$467	$196
Annual Charges w/Potential Benefits (3)	$591,293	$560,545	$436,545
Annual Charges per New Res. Unit	$266	$252	$196

(1) Assumes fixed charge per res. unit $19.66 per month per SCWD 2004 schedule for 5/8" meter service charge
(2) Commodity charge per res. unit $37.50 per month, based on:
1,500 cubic feet
$2.50 /ccf (SCWD 2004 schedule for Tier 1 regular domestic service.
(3) Potential benefits assuming that General and Administrative charges do not increase in proportion to addition meters. Additional benefits may accrue if further operating efficiencies can be achieved.

Summary
Wastewater Collection
Financial Analysis

Table 5
Wastewater Delivery Options
Capital Costs and Financing
Total, Both Districts

	Alternative		
	Alt. 1	Alt. 2	Alt. 3
Number of Units			
Residential	2,225	2,225	2,225
Hotel	100	100	100
Total	2,325	2,325	2,325
Capital Costs			
Total	11,304,043	10,978,043	10,085,993
Cost per Res. Unit	5,080	4,934	4,533
Connection Fees			
Total	5,652,022	5,489,022	5,042,997
Costs net of Fees			
Total	5,652,022	5,489,022	5,042,997
Debt Service (1)			
Annual Total (Residential)	352,300	342,140	314,338
Annual per Residential Unit	158	154	141
25-Year Total	8,807,501	8,553,500	7,858,462
25-Year Total per Res. Unit	3,958	3,844	3,532

(1) Finance assumptions

interest rate:	3.75%
term:	25

Table 6
Wastewater Delivery Options
Operating Charges
Total, Both Districts

	Alternative		
	Alt. 1	Alt. 2	Alt. 3
Number of Units			
Residential	2,225	2,225	2,225
Hotel	100	100	100
Total	2,325	2,325	2,325
Operating Charges			
Annual Residential Charges (1)	$268,809	$259,695	$222,945
Annual Charges per Res. Unit	$121	$117	$100
25-Year Total per Unit (2)	$4,405	$4,255	$3,653
Discounted Present Value per Unit	$1,026	$992	$851

(1) Assumes charge per res. unit $8.35 per month, based on 1,500 cubic feet IRWD rate schedule for single-family units over 1,000 cf/month

(2) Assumes charges increase over the long run at inflationary rate

Water Delivery Financial Analysis

Table 7
Water Delivery Options
IRWD Capital Costs and Financing

		Alternative		
		Alt. 1	Alt. 2	Alt. 3
Number of Units				
Residential		665	975	2,225
Hotel		0	0	100
Total		665	975	2,325
Capital Costs				
Total		10,320,450	11,084,550	28,464,975
Cost per Res. Unit		15,519	11,369	12,793
Connection Fees				
Total	50%	5,160,225	5,542,275	14,232,488
Costs net of Fees				
Total		5,160,225	5,542,275	14,232,488
Debt Service (1)				
Annual Total (Residential)		321,646	345,459	887,135
Annual per Residential Unit		484	354	399
25-Year Total		8,041,138	8,636,484	22,178,375
25-Year Total per Res. Unit		12,092	8,858	9,968

(1) Finance assumptions
interest rate: 3.75%
term: 25

Table 8
Water Delivery Options
SCWD Capital Costs and Financing

		Alternative		
		Alt. 1	Alt. 2	Alt. 3
Number of Units				
Residential		1,560	1,250	
Hotel		100	100	
Total				
Capital Costs				
Total		24,980,830	24,137,130	
Cost per Res. Unit		16,013	19,310	
Connection Fees				
Total	50%	12,490,415	12,068,565	
Costs net of Fees				
Total		12,490,415	12,068,565	
Debt Service (1)				
Annual Total (Residential)		778,549	752,254	
Annual per Residential Unit		499	602	
25-Year Total		19,463,717	18,806,351	
25-Year Total per Res. Unit		12,477	15,045	

(1) Finance assumptions:

interest rate:	3.75%
term:	25

Table 9
Water Delivery Options
IRWD Operating Charges

	Alternative		
	Alt. 1	Alt. 2	Alt. 3
Number of Units			
Residential	665	975	2,225
Hotel	0	0	100
Total	665	975	2,325
Operating Charges			
Annual Residential Charges (1)	$31,122	$45,630	$104,130
Commodity Charges			
Annual Residential Charges (2)	$99,351	$145,665	$332,415
Total Charges			
Annual Residential Charges	$130,473	$191,295	$436,545
Annual Charges per Res. Unit	$196	$196	$196

(1) Assumes fixed charge per res. unit
(2) Commodity charge per res. unit

$3.50 per month per IRWD 2004 schedule for single-family units
$12.45 per month, based on:
1,500 cubic feet
$0.83 /ccf IRWD 2004 schedule for single family units, conservation base rate

Table 10
Water Delivery Options
SCWD Operating Charges

		Alternative		
		Alt. 1	Alt. 2	Alt. 3
Number of Units				
Residential		1,560	1,250	
Hotel		100	100	
Total				
Operating Charges				
Annual Residential Charges	(1)	$355,680	$285,000	
Commodity Charges				
Annual Residential Charges	(2)	$702,000	$562,500	
Total Charges				
Annual Residential Charges		$1,057,680	$847,500	
Annual Charges per Res. Unit		$678	$678	
Potential Financial Benefit				
Fixed Component of Charges	(3)	($596,860)	($478,250)	
Net Residential Cost		$460,820	$369,250	
Annual Cost per New Res. Unit		$295	$295	
Annual Cost per Total Res.	(4)	$578	$619	

(1) Assumes fixed charge per res. unit $19.00 per month per SCWD 2004 schedule for 5/8" meter service charge
(2) Commodity charge per res. unit $37.50 per month, based on:
1,500 cubic feet
$2.50 /ccf (SCWD 2004 schedule for Tier 1 regular domestic service.
(3) Fixed component assumed equal to General and Administrative expenditures for Retail Operations 2004-04 budget, less share of workers comp, payroll taxes, health insurance and pension plan costs for Transmission and Distribution salaries. $342,430 or $383 per FM
(4) Existing meters (EM) 895 $958,760 retail operating budget $1,071 /EM

Wastewater Collection
Financial Analysis

Table 11
Wastewater Collection Options
IRWD Capital Costs and Financing

		Alternative Alt. 1	Alt. 2	Alt. 3
Number of Units				
Residential		665	975	2,225
Hotel		0	0	100
Total		665	975	2,325
Capital Costs				
Total		1,792,800	2,479,300	10,085,993
Cost per Res. Unit		2,696	2,543	4,533
Connection Fees				
Total	50%	896,400	1,239,650	5,042,997
Costs net of Fees				
Total		896,400	1,239,650	5,042,997
Debt Service (1)				
Annual Total (Residential)		55,874	77,269	314,338
Annual per Residential Unit		84	79	141
25-Year Total		1,396,853	1,931,737	7,858,462
25-Year Total per Res. Unit		2,101	1,981	3,532

(1) Finance assumptions
interest rate: 3.75%
term: 25

Table 12
Wastewater Collection Options
SCWD Capital Costs and Financing

		Alternative		
		Alt. 1	Alt. 2	Alt. 3
Number of Units				
Residential		1,560	1,250	
Hotel		100	100	
Total		1,660	1,350	
Capital Costs				
Total		9,511,243	8,498,743	
Cost per Res. Unit		6,097	6,799	
Connection Fees				
Total	50%	4,755,622	4,249,372	
Costs net of Fees				
Total		4,755,622	4,249,372	
Debt Service (1)				
Annual Total (Residential)		296,426	264,871	
Annual per Residential Unit		190	212	
25-Year Total		7,410,648	6,621,763	
25-Year Total per Res. Unit		4,750	5,297	

(1) Finance assumptions

interest rate:	3.75%
term:	25

Table 13
Wastewater Collection Options
IRWD Operating Charges

	Alternative		
	Alt. 1	Alt. 2	Alt. 3
Number of Units			
Residential	665	975	2,225
Hotel	0	0	100
Total	665	975	2,325
Operating Charges			
Annual Residential Charges (1)	$66,633	$97,695	$222,945
Annual Charges per Res. Unit	$100	$100	$100
25-Year Total per Unit (2)	$3,653	$3,653	$3,653
Discounted Present Value per Unit	$851	$851	$851

(1) Assumes charge per res. unit $8.35 per month, based on
1,500 cubic feet
IRWD rate schedule for single-family units over 1,000 cf/month

(2) Assumes charges increase over the long run at inflationary rate.

Table 14
Wastewater Collection Options
SCWD Operating Charges

	Alternative		
	Alt. 1	Alt. 2	Alt. 3
Number of Units			
Residential	1,560	1,250	
Hotel	100	100	
Total	1,660	1,350	
Operating Charges			
Annual Residential Charges (1)	$202,176	$162,000	
Annual Charges per Res. Unit	$130	$130	
25-Year Total per Unit (2)	$4,725	$4,725	
Discounted Present Value per Unit	$1,101	$1,101	

(1) Assumes charge per res. unit $10.80 per month, based on IRWD/OCSD charges of $8.43 /month, plus 28% OH/admin

(2) Assumes charges increase over the long run at inflationary rate.

Response to Comments

Tettemer & Associates
A Division of The Keith Companies

Date: February 28, 2005 **Job No.:** 110244.00.000

To: **Project:** East Orange Utilities Study

From:

CC:

Re: Comments and Responses from the Working Group

Comments are noted in italics.

SECTION	
	Santiago County Water District
1.1	*Introduction* *Comment: The study's content of possible service providers relative to the sphere of influence area is incomplete. Santiago Hills I and II are included as part of the proposed annexation to the city of Orange, and clearly are within city of Orange's sphere of influence and as such they should have been included in the study. There appears to be more then one option for providing water and sewer service to the areas not currently considered in the study.* Response: Santiago Hills II is included as part of the proposed annexation into the city of Orange. However, other service providers did not request the opportunity to provide water and/or sewer services to the area. Therefore, there were no other alternative service provider options to evaluate for the areas outside of the Study Area.
1.3	*Potential Service Providers* *Comment: The majority of the proposed development within the three sub-areas is within SCWD's borders (1700 of 2450 DU, or 70 %); so logic would dictate that the base case should consider SCWD as the primary service provider.* Response: The majority of the study area is currently within the service area of Santiago County Water District. The first alternative evaluated assumed that the current district boundaries would remain in effect. Therefore,

SECTION	
	Alternative I is the same as "the base case." The other alternatives are compared to Alternative I.
2.2.2	*1. Capital Costs* *Comment: Sentence one regarding the funding of major water supply facilities seems to be incomplete; all agencies have to determine appropriate methods for funding these facilities.* Response: The entire first paragraph was modified per your suggestion.
2.2.2	*2.Financing/Debt Service Costs* *Comment: What is the basis for assuming that 50% of the capital costs are financed? This appears to be an arbitrary assumption and probably should be justified.* Response: The 50% financing option was an assumption of the study. The paragraph in the report has been modified to better explain this assumption.
2.2.2	*3. Water, Operational & Maintenance Costs; 2nd Paragraph* *Comment: We agree that operational costs include the cost of water, power, repair and maintenance of facilities, and replenishment costs. However, the analysis of actual O & M costs is never addressed in report and should be. As an example, dual water distribution systems have higher O & M maintenance costs than a single water distribution system.* Response: Data was not available regarding the individual components that make up the O&M costs. Therefore, the study used historical total average costs per dwelling unit to approximate the O&M costs. The costs to maintain a buried pipeline is not nearly as significant as the costs to maintain the booster pump stations and the water storage reservoirs.
2.2.3	*1.Bifurcation of District Service Areas:* *Comment: This section states that the study "reviewed the financial impacts that may occur if SCWD were to lose a portion of its existing territory". We cannot find any analysis of this issue in the report; however the report needs to address the financial impacts of this issue.*

SECTION	
	Response: Section 2.3.5 discusses the financial resources that have been expended by SCWD in anticipation of the development within the study area. No other financial losses by the District were provided.
2.3.2	*Proposed Water Distribution Systems (1st Paragraph)* *Comment: At the present time, the study only includes distribution facilities and new proposed water supply facilities included in SCWD's Master Plan, which was a conservative planning effort document, not a lowest bid-proposal. Existing or future water supply facilities required to serve the proposed development under IRWD's alternatives also need to be included as a cost. A full or prorated share of these costs should be allocated to the proposed development under IRWD's proposal for service.* Response: It was our intent to use conservative unit costs for all items uniformly throughout the study. The same unit costs were used for both agencies. The study considered only projected future costs to the agencies and residents. The historic costs to construct existing facilities were considered to be sunk costs.
2.3.2	*1.a Proposed SCWD Facilities* *Comment: This section states that the costs for the 16" water transmission main in Santiago Canyon Road would be allocated appropriately in the cost analysis. It does not appear that this has been done in the cost analysis in Appendix B. In addition, we have reviewed the lengths of various sizes of pipe under the SCWD alternatives and believe that some corrections need to be made in that Table. Please refer to the specific comments made regarding this issue in subsequent sections.* Response: The projected cost for the proposed 16-inch water transmission main has been allocated to the Study Area consistent with the SCWD Master Plan. In the cost tables provided in the Appendix, the length was adjusted to remove the costs that would be allocated to ID-2 and other areas within the District. A footnote has been added to the cost table to explain the allocation.
2.3.3	*1. b Reservoir Storage Capacity* *Comment: The SCWD reservoir storage amounts under Alternatives1 and 2 needs to be normalized to be comparable to IRWD's proposed storage.*

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	Specifically, non-potable demands should not be included as part of local emergency storage under any alternatives since these are centralized irrigation demands which can easily be isolated and turned off during a short term emergency whether they are connected to the domestic system or are on a separate non-domestic system. Response: During a longer duration emergency, the district would be able to either coordinate with the centralized irrigation users or manually shut off the valve to each service. However, it does not appear reasonable that the district's operations crew could drive around the entire development and shut down each isolation valve within a few hours if there were a sudden interruption to the water supply during a day within the peak water usage months. With the dual piping, one valve at each backflow preventor could be quickly closed. Therefore, the required reservoir storage volume has not been modified.
2.3.3	*1. b Reservoir Storage Capacity* *Comment: The proposed 8,000 gpm 4-hour fire flow for Sub-Area 3 appears to be extremely high since this type of fire flow is normally specified for regional shopping centers or commercial developments only. We recommend that this be reduced in accordance with OCFA standards.* Response: It is our understanding that a 100-room hotel and a golf course clubhouse are proposed to be located in Sub-Area 3. Even if the proposed hotel will be designed with fire protection sprinklers, the Orange County Fire Authority would still require a fire protection water supply equal to 8,000 gallons per minute for a duration of four hours.
2.3.3	*1. Infrastructure Reliability / b. Reservoir Storage Capacity* *Comment: Reliability of all of the proposed IRWD alternatives is reduced by only having one reservoir per pressure zone. SCWD has proposed multiple reservoirs, which increases reliability and operational flexibility during periods when a reservoir has to be taken out of service for maintenance or repairs.* Response: Based on the SCWD Master Plan, two Zone 1120 reservoirs and one Zone 1360 reservoir are proposed by SCWD. All three of these tanks are proposed to be constructed of welded steel. Welded steel reservoirs need to be taken out of service approximately every five to seven years for inspection and possible re-coating. Therefore, it is prudent for SCWD to propose two

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	tanks for the 1120 zone. However, redundant storage is not proposed by SCWD. Therefore, the reliability is slightly better in the low demand months, but not significantly during the peak demand months.
2.3.4	*1. Capital Costs (2nd paragraph)* *Comment: It should be noted that SCWD has existing on-site water facilities in Santiago Canyon Road, not "in close proximity", which are capable of serving both Sub areas 2 & 3.* Response: The SCWD Master Plan describes the existing facilities within Sub-Area 2 and 3 to be the 12-inch pipeline along Santiago Canyon Road, the Fleming Reservoir and the Fleming Pump Station. The Master Plan concludes that these facilities are not adequate for the proposed development. Therefore, the only relevant facilities are the 20-inch pipeline that crosses the toll road, the Santiago Hills Reservoir and the Santiago Hills Pump Station. Since all of these facilities are in close proximity to the Study Area, the text has not been revised.
2.3.4	*1.Capital Costs (Page 21 - 3rd ¶)* *Comment: Costs for storage as calculated appear excessively high. SCWD uses welded steel tanks, which are less expensive than IRWD's standard post tensioned concrete tanks.* *It should also be noted that SCWD has funded mitigation areas as part of the NCCP for future reservoir sites and has invested approximately $350,000 in the NCCP for development of future facilities for this area.* Response: We agree that a welded steel tank will normally require a lower initial capital cost than a concrete tank. However, most water industry professionals believe that the on-going O&M costs for a concrete tank is significantly less than a steel tank. This O&M cost differential is thought to be attributable to the reduced need to repair the steel plate coating. Therefore, any initial cost savings realized by the construction of a steel tank could be offset by higher O&M costs. Also, the grading, piping and construction of two tanks at one site will require significantly more capital costs than a single tank. The fact that SCWD has purchased NCCP "take" was not made available during the preparation of this report. IRWD also has purchased take within

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	the NCCP. Therefore, this will not be a differentiating cost, but has been noted in the report.
2.3.4	*1. Capital Costs (Page 22)* *Comment: Costs for existing water supply facilities (such as wells, transmission mains, and pump stations) need to be included under each alternative included in the study. Right now only costs for new SCWD facilities are included. This is not a realistic or logical comparison.* Response: The study considered only projected future costs to the agencies and residents. The historic costs to construct existing facilities were considered to be sunk costs and not included in the analysis.
2.3.4	*3. Water, Operational and Maintenance Costs* *Comment: O & M costs for Alternative 3 will be higher due to dual distribution system, and it appears no capital costs are included for pumping facilities or transmission mains which would be needed to supply either a reclaimed water, or non-potable Irvine Lake supply to the various isolated non-potable distribution systems within the three sub-areas.* Response: The only dual distribution facilities proposed for Alternative 3 are parallel buried non-potable pipelines within the development area. No additional pumping stations are currently proposed.
2.3.5	*1. Bifurcation of District Service Area* *Comment: SCWD has constructed a significant number of water supply facilities to serve this area. This would result in significant stranded cost to SCWD under Alternatives 2 & 3. We believe this issue needs to be addressed in the study.* Response: The known financial resources that have been expended by SCWD in anticipation of the development within the study area are included in the analysis. No other financial losses by the District were provided.
2.3.5	*3. Transfer of Assets, Properties, Debt* *Comment: What assets are proposed to be transferred? SCWD has not agreed to any transfer of assets, has not been approached by or requested to transfer District assets by LAFCO or any other entity, and vehemently*

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	opposes any unilateral transfer of District assets. The note with ETC will remain the responsibility of SCWD since the note is an obligation of the existing district and is paid with connection fees collected from the existing District, excluding all future development in ID1. Response: The utilities study does not propose that any assets be transferred. It was a part of the scope to be studied. The notes regarding the district's debt have been modified in the report.
2.4.1	*Reliability of Service* *Comment: This section talks about impacts to Yorba Linda Water District wells. Yorba Linda's wells are not located even remotely close to the proposed SCWD well site in the city of Orange; how can this proposal impact their wells? Also there is no rational basis for stating that Alternative 3 is more reliable than any other alternative. All of the alternatives use the same basic water supply sources.* Response: The reference to Yorba Linda Water District was removed from the report. However, the City of Orange does have concerns of the possible effects of draw down to their wells from the proposed SCWD well. Until the well is drilled, tested and monitored, its ability to deliver the required volume of water is not known. The cost of the water supply source should have a larger contingency percentage than the other water facilities. Once established, it should be a reliable water supply. Therefore, the comment was moved to the cost discussion portion of the report.
2.4.2	*Total Costs to Future Residents* *Comment:* - *Conclusions regarding preferred alternative need to be revisited based on a re-analysis of costs* - *O & M costs have not been calculated. How does the Keith Companies conclude they are less expensive under Alternative 3?* - *Other conclusions regarding cost savings should be revisited based on a valid analysis of costs and relative significance of differences.* Response: The revised cost estimates have been reflected in the final report. The

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	O&M costs have been approximated based on the best information provided. Alternative 3 would be the less costly to maintain since there would be less infrastructure to maintain. Due to the size of each district, IRWD would recognize economies of scale in providing more efficient staffing.
2.4.3	<u>*Impacts to Existing Water Systems and Districts*</u> *Comment:* - *SCWD has invested significantly in facilities to serve the future development. Transferring of the service area to IRWD would result in a significant stranded cost issue for SCWD.* - *The statement in the last sentence is not true. SCWD would maintain equal rates throughout the district and any cost savings to existing customers would be the same as new customers in Improvement District 1. Existing SCWD customers would be penalized by the removal of areas from the District under Alternatives 2 & 3 which would result in the loss of approximately $285,000 per year in saving due to the economies of scale under Alternative 1. (see page 24)* - *Transfer of the TCA note is not required as discussed previously* Response: The known financial resources that have been expended by SCWD in anticipation of the development within the study area are included in the analysis. No other financial losses by the District were provided. The last sentence has been removed from the final report. The focus of the analysis was the total estimated cost to the future residents of the study area. The comments regarding the transfer of the TCA note have been deleted.
Table 2-10	<u>*Summary of Conclusions, etc.*</u> *Comment: We disagree with the conclusion that the impacts under system bifurcation/secondary financial impacts for Alternatives 2 & 3 are "none or minor". As stated previously, we believe that both of these alternatives have significant financial and operational impacts to SCWD.* Response: The known financial resources that have been expended by SCWD in anticipation of the development within the study area are included in the analysis. No other financial losses by the District were provided.

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3.2.2	*3. Operational, Maintenance and Treatment Costs* *Comment: We agree with the definition of operational costs. However, the analysis of actual O & M costs is never addressed in report and should be. As an example, the various alternatives have different sewage pumping requirements which will result in significant differences in energy costs.* Response: Detailed information regarding the individual components that comprise O&M costs were not available. From the information provided to us, we cannot determine that there would be significantly different sewage pumping requirements for the three alternatives. All alternatives require the same pumping for Sub-Area 3. The IRWD options pump to the current SCWD/IRWD boundary within Sub-Area 1. The SCWD options pump to the current SCWD/IRWD boundary along Santiago Canyon Road. From these points, all alternatives flow by gravity to the respective wastewater treatment plants.
3.3.1	*1b. Alternative 1 – Proposed IRWD Wastewater Collection Facilities* *Comment: A lift station would be required to serve a portion of Area 1; entire area does not flow by gravity.* Response: A lift station has been added to Alternative 1. For Alternatives 2 and 3, the study assumes that the wastewater would flow to the proposed lift station within Sub-Area 2.
Figure 5	*Alternative 1* *Comment: The second force main should terminate in Santiago Canyon Road at the SCWD/IRWD boundary, which is the high point, not on the west side of the Eastern Transportation Corridor.* Response: The figure and text were revised per your comment.
3.3.3	*1. Capital Costs* *Comment: Costs for off site treatment, disposal and off-site conveyance facilities need to be included for ALL AREAS under all alternatives. The current cost summary only includes treatment/disposal costs for Sub-Area 3.* Response: The capital costs include all future capital expenditures required

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	to provide wastewater collection and treatment services to the Study Area. For this analysis, existing excess capacity that can be utilized for the Study Area has not been included in the capital costs.
3.3.3	*1. Capital Costs (Page 36)* *Comment: Costs for the Harvard T.S. need to be allocated to Sub-Areas 1 and 2 under the IRWD service alternative.* Response: Based on the analysis, the Harvard Trunk Sewer does not require any increases to its capacity in any of its reaches. To our knowledge it is in good operating condition. Therefore, it does not appear that any future capital costs will be required. Since only new dollars spent are included in the analysis, no additional capital costs are required.
3.3.3	*3. O & M Costs* *Comment: The study should look at O & M costs for each alternative since there are significant differences in pumping requirements (and energy costs) between the various alternatives.* Response: Detailed information regarding the individual components that comprise O&M costs were not available. From the information provided to us, we cannot determine that there would be significantly different sewage pumping requirements for the three alternatives. All alternatives require the same pumping for Sub-Area 3. The IRWD options pump to the current SCWD/IRWD boundary within Sub-Area 1. The SCWD options pump to the current SCWD/IRWD boundary along Santiago Canyon Road. From these points, all alternatives flow by gravity to the respective wastewater treatment plants.
3.3.3	*3. O & M Costs* *Comment: Wastewater charges for SCWD are grossly overstated. Treatment costs would be charged by OCSD, and would be comparable to IRWD's and the remainder of the County. The only costs to SCWD would be the operation and maintenance of the sewage collection system, which should be comparable to IRWD's charges.* Response: The calculations were revised based on IRWD's charges to OCSD, and an additional overhead factor was added. The resulting charges will be low, since they do not explicitly reflect operations and maintenance of

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	wastewater collection system, but we can still refer to the upper end of the cost range represented by the current analysis. In addition to revised appendix tables, and revisions to the summary tables, the second paragraph of 3.3.3 (Subsection 3) was revised.
3.4.1	*Reliability of Service* *Comment*: *We disagree that the Sunflower trunk sewer cannot be considered reliable unless it has adequate capacity. SCWD agrees that paralleling of a portion of the Sunflower trunk sewer may be required and would agree to pay any costs for paralleling not absorbed by OCSD. Building pipelines is a basic assumption throughout the study and this is no different then building a trunk sewer within the development. IRWD also indicated to us during the preparation of the SCWD Master Plan that they were not sure whether the Harvard Trunk Sewer had adequate capacity to serve Sub-Area 3 or what the costs were to utilize this conveyance. We believe that the Harvard trunk sewer capacity and cost issues should be examined further.* *SCWD would hire experienced and qualified staff to operate the wastewater collection system. The current SCWD General Manager has extensive experience in wastewater collection system operation and maintenance.* Response: The final report has been modified. The Sunflower trunk sewer would be reliable. However, a larger contingency for the wastewater collection system capital cost should be provided. Similarly, the SCWD wastewater operators would be reliable. Again the terminology should have included uncertainty rather than reliable.
3.4.2	*Total Costs to Future Residents* *Comment: The conclusions are not accurate and need to be revised based on previous comments.* Response: The conclusions were modified as appropriate.
Appendix B	*Water Distribution System Capital Cost Comparison* *Comment: The pipeline footages for SCWD under Alternatives 1 & 2 should be corrected as follows:* *24 inch - 14,100 LF* *20 inch – 4,900LF* *16 inch (off-site) – 15,000LF*

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	16 inch (on-site) – 23,200LF (13,900 LF should be prorated with remainder of SCWD. Master Plan proposed charging ID 1 for 12" pipeline with remainder of District paying over sizing cost.) *12 inch – 2,400 LF* Response: Per Tables 8-1 and 8-2 of the October 2003 SCWD Master Plan, the future pipelines that will be allocated to the study area (ID-1) area as follows: 24 inch - 18,000 LF (20-inch size equivalent allocated to the Study Area, incremental upsizing to 24 inch charged to ID-2 and other areas within the District) 20 inch - 1,500 LF 16 inch (off-site) – 15,000 LF (for well) 16 inch (on-site) – 17,937 LF (19,930 LF of 16 inch pipe to serve the Study Area, with this pipeline from the East Orange Lake Village to the Fleming Reservoir being allocated 90 percent to the Study Area, 0.8 percent to ID – 2 and 9.2 percent to Outside. 90 percent of 19,930 is 17,937) 12 inch – 17,700 LF
	Irvine Ranch Water District
	<u>*Page 15, Last Paragraph*</u> *Comment: The mix of IRWD water supplies is incorrect. IRWD's total annual groundwater supply, including the DATs project, is approximately 36,000 acre feet, of which DATs contributes approximately 8,000 acre feet. The annual yield attributed to the Orange County groundwater basin is also incorrect.* *In addition to the water supply mentioned, IRWD also has untreated and native water from Irvine Lake and reclaimed water from MWRP in our supply mix.* Response: The tables in the IRWD Water Supply Assessment were interpreted incorrectly. The statistics have been modified in the final report. The other water supplied were added to the discussion regarding the district's water supply portfolio.
2.3.3, 1, b	*Comment: The report states it would be more appropriate to use a higher maximum day factor for sizing the reservoirs in this area than IRWD's standard factor of 1.8 x average daily demands. Though this might be more*

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	appropriate in sizing other facilities, pump stations, and pipelines for this area, IRWD feels it would be inappropriate for storage calculations in this situation. The higher demand factor would only add a nominal amount of storage to the size of these reservoirs, which potentially will already have water quality concerns because the majority of the reservoir capacity is emergency storage and fire flow that will not be used on a daily bases. Response: To be consistent with IRWD standards and to be in closer agreement with the SCWD peaking factors, the domestic water maximum day peaking factor to size the reservoirs was changed to 1.8. This provided an overall water maximum day peaking factor of 2.30, still higher than the SCWD peaking factor of 2.25.
2.3.3, 1, b	*Comment: IRWD assumed all non-potable (irrigation) storage for Zones 6 and 7 would be accounted for in the existing zone 5 tank. The zone 6 and 7 tanks will be filled from the zone 5 tank during the night when irrigations demands typically occur. Further, if in the future IRWD were to build separate non-potable water tanks to serve this area with reclaimed water, then redundant storage would not exist in the Zone 6 and 7 areas.* Response: To provide water storage that would be equally reliable to the facilities proposed by SCWD, the study assumed that IRWD should provide operational storage for the non-potable water demands for the Zone 7, 8R and 8 service areas by a gravity feed system. Therefore, the operational storage for these non-potable water demands was included in the Zone 7 and 8 reservoirs. The was done for comparison purposes only and may be different than what is proposed by the district.
D	*<u>Page 18</u>* *Comment: It is unclear as to what portion of future infrastructure replacement costs is included in operating costs. What is the impact on monthly rates for this cost?* Response: The individual components of the O&M costs were not available. Therefore, the total O&M cost includes operations, maintenance and a small amount for replacement all lumped together.
2	*<u>Page 23, First Paragraph</u>* *Comment: It appears the construct of bond financing one half of the total capital costs is based upon pay-as-you-go connection fees absorbing the*

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	remaining half. We need to understand this better. IRWD's approach has been to issue general obligation debt for almost all capital costs and to use a combination of property taxes and connection fees to meet annual debt service. The approach described in this section may lead to the same result in the long run, but there may be timing issues that complicate matters (i.e., infrastructure precedes development and the payment of connection fees). This language also appears to be in conflict with Section 2.2.2, Total Cost to Future Residents, where it is stated that all future costs will be funded by residents through monthly bills and property taxes. Response: The wording in the report has been modified. The percentage financed was arbitrary and was simplified to not take into account the interest costs incurred from the time that the infrastructure is constructed until the time that the connection fees are paid. While very important from a cash flow perspective, the interest payments for the short duration were not considered material to the study.
2.4.1	*Page 26* *Comment: The reference to Yorba Linda appears to be in error. Is Serrano Water District the intended reference?* Response: The reference to Yorba Linda Water District was removed.
	Page 33, Second Paragraph *Comment: In Alternative 1, a portion of the last parcel in Area 1 closest to the SCWD boundary would probably require a lift station and a force main to convey its sewer flow. In this alternative IRWD would likely share in the cost of the lift station that SCWD would have to build to serve the remaining portion of Area 1 in their service area.* Response: A lift station has been added to Alternative 1. For Alternatives 2 and 3, the study assumes that the wastewater would flow to the proposed lift station within sub-area 2.
3.3.2	*Page 34* *Comment: IRWD will have the option of treating the sewage from this area at MWRP or sending to OCSD for treatment.* Response: The final report was modified to note this option.

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	City of Orange
	Comment: The City of Orange is committed to having one water service provider in the study area. Response: This preference was noted in the conclusions section of the final report.
	Comment: The City of Orange is not in favor of having new facilities (a water well) built within its existing service area by another water utility for the purpose of serving the study area. Response: This preference was noted in the conclusions section of the final report.
	Comment: The City of Orange reserves the right to serve a portion of the study area or the entire study area if it is determined to be in the best interest of the future residents. Response: When the study was performed, the city of Orange was provided the opportunity to state their case for being the best entity to provide water service to the study area. The city did not provide any reports or data to deem it the best service provider to the future residents of the study area. Therefore, the final report does not include the city of Orange as a possible provider.